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THESIS

DEVELOPMENT OF A FORECASTING MODEL OF NAVAL AVIATOR RETENTION RATES

by

Matthew F. Coughlin

March 1996

Principal Advisor:	Stephen L. Mehay
Associate Advisor:	Julie A. Dougherty

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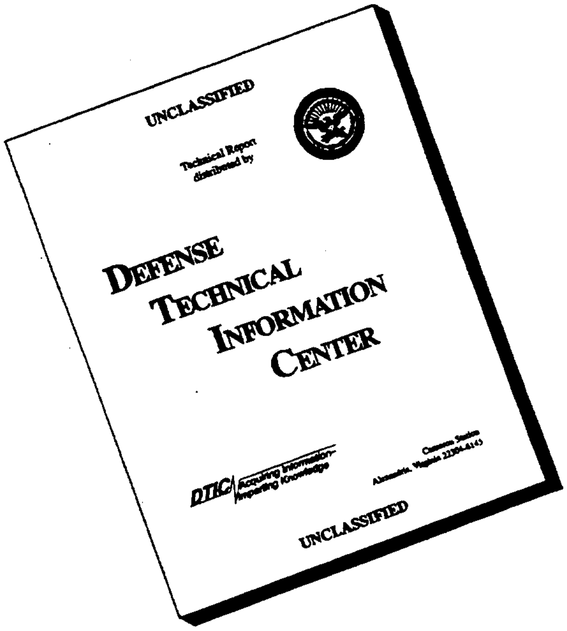

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The objective of this thesis is to develop an estimating model to predict the effects of various internal and external variables on Naval aviator retention rates. The estimating model will be useful to aviation program managers to develop a spreadsheet tool for predicting retention rates for Naval aviators. Past analyses have focused mainly on analyzing micro-level data. This thesis uses grouped retention rates for all Naval aviators for fiscal years 1977 through 1993 to determine factors associated with the retention decisions made by specific cohorts. The analysis quantifies the relationships between retention and various internal, external and time-related factors. Among the internal factors are various downsizing policies such as the Voluntary Separation Incentive/ Selective Separation Bonus (VSI/SSB) program and rightsizing tools such as the Aviation Continuation Pay (ACP) program. External factors examined include both civilian unemployment rates and major airline hiring rates. Additionally, time since minimum service requirement (MSR) was included in the models to control for the effects on aviator continuation rates of the expiration of the MSR during the 6-11 year mark of an aviator's career. Models were specified for each of the naval aviation communities including jet, propeller, and helicopter, and estimated using a grouped LOGIT estimation technique. The study finds that civilian unemployment rates, VSI/SSB, ACP and airline hiring rates have significant effects on retention in the various aviation communities.

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DEVELOPMENT OF A FORECASTING MODEL OF NAVAL AVIATOR RETENTION RATES

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Lieutenant, United States Navy
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Submitted in partial fulfillment
of the requirements for the degree of

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March 1996

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The objective of this thesis is to develop an estimating model to predict the effects of various internal and external variables on Naval aviator retention rates. The estimating model will be useful to aviation program managers to develop a spreadsheet tool for predicting retention rates for Naval aviators. Past analyses have focused mainly on analyzing micro-level data. This thesis uses grouped retention rates for all naval aviators for fiscal years 1977 through 1993 to determine factors associated with the retention decisions made by specific cohorts. The analysis quantifies the relationships between retention and various internal, external and time-related factors. Among the internal factors are various downsizing policies such as the Voluntary Separation Incentive/ Selective Separation Bonus (VSI/SSB) program and rightsizing tools such as the Aviation Continuation Pay (ACP) program. External factors examined include both civilian unemployment rates and major airline hiring rates. Additionally, time since minimum service requirement (MSR) was included in the models to control for the effects on aviator continuation rates of the expiration of the MSR during the 6-11 year mark of an aviator's career. Models were specified for each of the naval aviation communities including jet, propeller, and helicopter, and estimated using a grouped LOGIT estimation technique. The study finds that civilian unemployment rates, VSI/SSB, ACP and airline hiring rates have significant effects on retention in the various aviation communities.

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I. INTRODUCTION

The objective of this thesis is to develop a model to examine the effects of various internal and external variables on Naval aviator retention rates. The training of Naval aviators is among the most expensive training provided by the Armed Forces. Therefore, it is safe to say that Naval aviation training is among the largest investments in human capital in the Department of Defense. It is for this reason that measures of retention are closely scrutinized by policy-makers and program managers. The manpower implications of aviator force management is crucial to both near- and long-term readiness.

Some argue that the carrier battle group is the centerpiece of naval warfare. It is the purpose of the carrier battle group to deploy combat aircraft worldwide with very short notice as a foreign policy tool. Shortages of naval aviators will have direct implications on the ability to maintain sea control and keep specified levels of battle groups at top readiness levels.

Because the investment of human capital in aviators is so extensive, the Department of the Navy must be able to closely monitor aviator retention rates. Retention rates must be maintained sufficiently high in order to guarantee a return on investment to the Navy. If retention is too low, the Navy incurs additional costs of training and "growing" an experienced aviator to replace each loss. Also the flow of junior officers into the senior billets will not be sufficient to meet billet requirements. These considerations are especially important in times when overall force reductions are taking place. Currently (1996), an atmosphere of "rightsizing" has replaced the "downsizing" mentality of the early 1990s. During this time of rightsizing the Navy must be able to follow continuation trends so that the high aviator turnover of the downsizing period does not repeat itself and threaten overall readiness.

In order for program mangers to monitor continuation patterns, a tool must be available to predict future continuation rates as a function of internal Navy rightsizing policies, external economic forces and time-in-service considerations. Aviation community managers must have the ability to separate the influence of internal policies from the external effects exerted by the civilian labor market. Once a set of predicted retention rates is obtained, program managers can devise policies on pay, bonuses, and other financial incentives to counterbalance the expected changes in military (e.g., downsizing) policies, and changes in the civilian sector (e.g., changes in airline hiring rates). Some internal policies that affect retention both negatively and positively include the VSI/SSB programs and ACP bonus programs. Other recent policy changes that affected retention included the extension of minimum service requirements and mandatory United States Naval Reserve commissions for all newly commissioned officers.

External factors that possibly affect retention include unemployment rate for professional civilian workers. Additionally, it has been hypothesized that another highly motivating external economic factor affecting aviation retention rates is the major airline hiring rates (AHR). The Department of Defense, and the Air Force in particular, has historically been concerned that the employment patterns of the major civilian airlines have had a detrimental effect on the retention of career aviators.

Therefore, it is essential to determine what effects that both internal policies and external economic factors have had on the underlying survival rates of Naval aviators. Of course, there are many other factors that play into separation decisions such as taste for military life, family separation, arduous sea duty and a host of other factors. This study will concern itself with qualitative data obtainable from readily accessible sources and with implementing econometric estimation techniques for grouped data.

The estimation technique used on the grouped data will consist of a LOGIT model estimated via maximum likelihood techniques. This differs from ordinary least squares (OLS) estimation, which has been used in past studies. The data set uses past continuation rates originally developed by Turner (1995). The grouped LOGIT method of estimation provides a quantitative estimate of the marginal effects of internal and external factors on Naval aviator retention. With this model in place, a spreadsheet program can be devised for use by the community manager to predict future retention rates to help guide internal pay and other incentive policies.

II. LITERATURE REVIEW

This study will focus on historical retention rate information to help predict future baseline continuation rates as a function of several internal and external economic factors. Continuation rates are computed as the percentage of an entering cohort remaining in service over a particular time period. Since these rates form the basis of the study, a review of the calculation procedure is needed.

A. CONTINUATION RATES

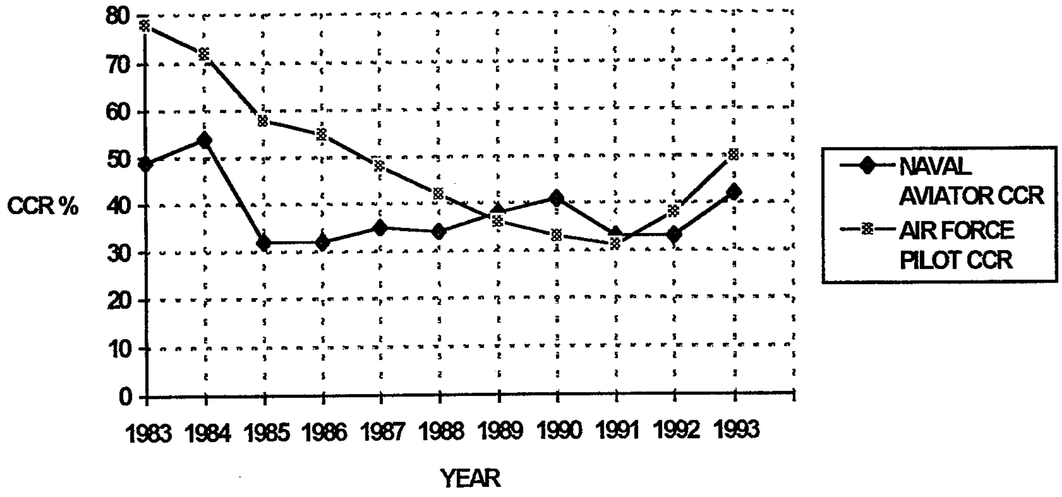
Continuation rates measure the proportion of a cohort remaining on active duty status from one year to the next. Two types of retention calculations are routinely used in the manpower field, Cumulative Retention Rates (CRR) and Minimum Service Requirement rates (MSR). CRR is now the official method of calculating survival rates (Hogan, 1995). The CRR is the product of the yearly continuation rates from year of service 6 through 11. This is calculated not from the cohort itself, but from a cross section of cohorts for a particular period (Hogan, 1995). Thus, CCR is calculated as:

$$CCR = \sum_{y=6}^{11} CR_{t,y}$$

where $CR_{t,y}$ is the continuation rate for a specified fiscal year t at year of service y. Note in this particular case that the CCR measures the continuation rate over the 6-11 year mark. The continuation rates themselves are calculated on a yearly basis. This is done by dividing the ending inventory of the cohort by the beginning inventory for the same cohort in a given fiscal year t. It is therefore evident that CCR is different from the cohort survival rate $CR_{t,y}$ (Hogan, 1995).

Historically speaking, the Navy has not suffered from the grip of low retention rates as much as the Air Force. Historically, CCR's for Air Force Pilots have been very unpredictable. The Air Force suffered its lowest CCR in FY 1979 when it dropped to 26 percent. After 1980, CCR's for the Air Force returned to a healthy 78 percent. But this success was followed by another wave of losses of aviators, with CCR's declining to the 36 percent range in 1990 (Crum, 1990). The Navy, on the other hand, has not had an impressive record. The Navy suffered two setbacks with aviator retention when CCR's decreased to 32 percent in FY 1985 and 1986. In FY 1991 and 1992 the Navy CCR for aviators decreased to 33 percent (BUPERS, 1995). This could well be due to the downsizing efforts being exerted at that particular time.

A comparison of Naval aviator and Air Force pilot CCR's is shown in Figure 1. It is observed that Navy CCR's have remained somewhat level since 1983. On the other hand, Air Force CCR's have steadily decreased following 1983. It is for this reason that much research in the field of aviation retention has come from Air Force sources.



Source: RAND (1995) and Bureau of Naval Personnel

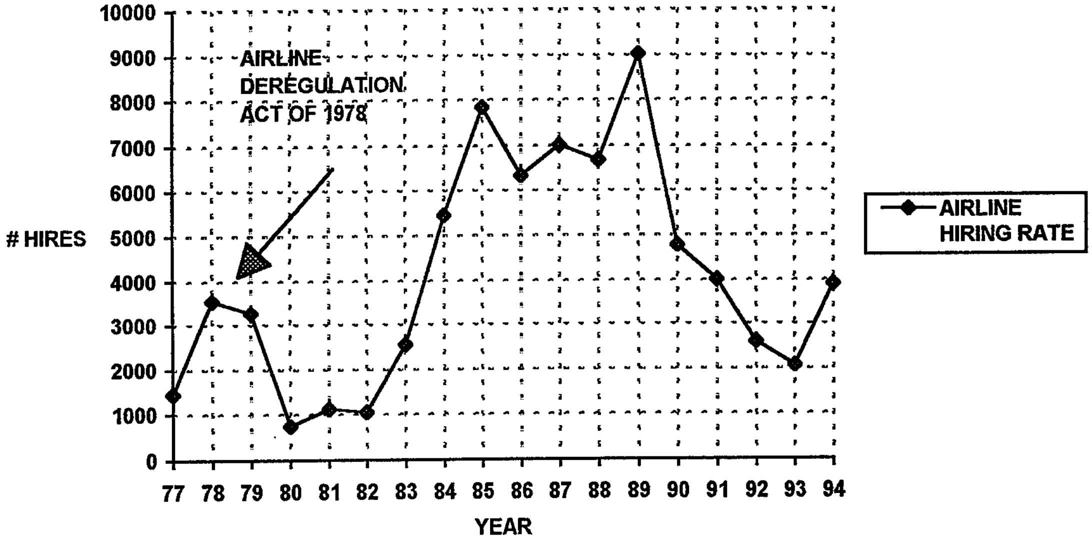
Figure 1. Air Force Pilot CCR vs. Naval Aviator CCR

B. EXTERNAL EFFECTS

One topic that consistently reappears in prior retention studies is the theme that commercial airline hiring rates are the single greatest threat to aviator retention. Lieutenant Colonel Rhodes, USAF, in his historical analysis of USAF pilot retention, reports that a booming economy combined with plentiful airline jobs on the outside is the primary reason for aviator losses (Simpson, 1987). According to Major Longino, who served in the Officer Branch at the USAF Retention Division in 1987, 75 percent of all Air Force pilots intended to leave service life for a career in the airlines (Simpson, 1987). Additionally, Major Gentile, USAF, reports a direct correlation between airline hiring and USAF pilot retention. (Simpson, 1987). Crum (1990) found that Air Force pilot retention was directly correlated with airline hiring rates. Whether or not this is "just an Air Force problem" remains to be seen. The desperation by the Air Force was best stated by Lt. Gen. Thomas Hickey, Deputy Chief of Staff for Personnel:

> "We have the bonus. We have the flight pay increase ...we have had almost annually, pilot retention conferences to find out what we can think of that was an irritant. We've reduced every one of those....Bluntly, we are out of ammunition...."

On the other hand, a report by RAND in 1995 stated, "Historical data shows time periods where there is an inverse relationship between civilian airline hiring and military pilot retention (that is, when civilian airline hiring goes up, military pilot retention goes down), and other times when hiring and retention move in the same direction" (RAND, 1995). One factor that was not addressed in the Rand report was how the Airline Deregulation Act of 1978 may have affected the situation. In Figure 2. one can see a sharp jump in hires by the airlines around the 1978, 1979 time-frame when deregulation was introduced.



Source: Future Aviation Professionals of America

Figure 2. Airline Hiring Rates 1977-1994

It is probably safe to say that airline hiring rates are not the major determinant of whether an aviator will decide to leave the service. Captain Simpson, USAF, conducted a study to predict aviator retention rates among Air Force pilots. Other than airline hires, he investigated indicators of the economy such as the overall unemployment rate, corporate profits, a help wanted advertisement index, and relative wage differences between civilian and military personnel. He used an Annualized Cost of Leaving model (ACOL) to predict continuation rates (Simpson, 1987).

A second Air Force study investigated the effect of several economic variables on Air Force pilot retention rates. The study adopted the idea of the "economic man," assuming a "pilot is an individual whose behavior is primarily shaped, both directly and indirectly, by various economic influences in the environment" (Cromer and Julicher, 1982).

Cromer and Julicher used 16 independent variables to describe the economic environment. Among the variables were: white collar unemployment, average percent change in Gross National Product, airline hiring rate, Consumer Price Index, average prime rate, an index of private housing units, and vendor performance. Much effort was expended towards examining the effect of lagged variables. This study appears to have been somewhat flawed due to the R squares of 1.0 for certain models. The author also discusses the "overlapping information" problem which would cause collinearity among the independent variables.

In his work on Naval aviator retention, Turner (1995) modeled the effects of downsizing policies on retention rates. By using the aggregate unemployment rate as one of his independent variables in an OLS regression model, he was able to determine that civilian unemployment rates were statistically significant in one Navy aviation community, fixed wing propeller aircraft, namely P-3 and C-130 aircraft. He theorized that fixed wing propeller type aviators were in more demand by civilian airlines. The assumption implicitly made by Turner is that civilian airline hiring rates are highly correlated with aggregate unemployment rates, which may not be true. Additionally, Hogan (1995) addresses several concerns with Turner's work. Hogan states, "The model was estimated using ordinary least squares regression. Because the dependent variable, the continuation rate, is a grouped rate, grouped logit is the more appropriate specification."

C. INTERNAL EFFECTS

We now turn to a consideration of internal policies that affect retention decisions. Again, Turner's work addresses various internal policies used during the drawdown to reduce the overall aviator manpower levels. He uses independent variables for the effect of both the ACP and VSI/SSB programs on retention. He found the ACP to be positive and significant in all aviation communities with the exception of the jet community. He concludes, "This outcome indicates that an increase in the number of bonuses available to a community significantly increases the continuation rate of that community, averaged over year group and fiscal year."

Using VSI/SSB as another independent variable, Turner found the effect of this variable to be statistically insignificant: also the coefficient was positive, which was the opposite to the hypothesized relationship. This result was explained as being due to extremely small numbers of observations that were eligible (3.7 percent of the data set) for the VSI/SSB. In their combined effort, Mehay and Hogan (1995) on the other hand, estimated that the net effect of the VSI/SSB programs on mid-career enlisted naval personnel to range from "modest to large." Their study was aimed at naval enlisted personnel in the FY 1992 time-frame. Although these studies are aimed at two different populations, there is credence in both the Turner and Mehay/Hogan studies pertaining to the effects brought about by the VSI/SSB programs.

D. SUMMARY

The literature review provides insight into previous research efforts pertaining to estimation of aviation continuation rates. The differences in methodologies used by various researchers identifies the source of some of the problems that arise when trying to predict retention rates. In the following chapters we take previous work by Turner and build upon it.

III. METHODOLOGY

The research effort in this thesis evolved from a continuation of Turner's work on Naval aviator continuation rates, although with less emphasis on the specific effects of drawdown policies on retention. This thesis estimates the multivariate models using a more appropriate grouped LOGIT technique instead of the traditional ordinary least square estimation technique used by Turner.

A. DATA

The data base used in this research was obtained from several sources. The main portion of data was obtained from Turner's (1995) original data. This data base was constructed by Turner in his research on the effect of Navy downsizing policies on aviatior retention rates. He used Officer Master Files (OMF) obtained from the Defense Manpower Data Center (DMDC) for fiscal years 1977-1993. The OMF yielded a database of 16,626 Naval aviators. After placing filters for individuals who were prior to their MSR year, who received a discharge other than honorable, or who separated due to Desert Shield/Desert Storm, the sample was reduced to 14,580 observations. Using this data base, Turner constructed EXCEL spreadsheets to calculate the grouped retention rates from FY 1977 to FY 1993 for every cohort (commissioning year group), who entered the Navy between 1960 and 1987.

Building on Turner, the database constructed in this thesis also consisted of Naval aviators with continuation rates for cohorts with less than 20 years of service (YOS). This filter was placed on the database in order to avoid possibly obtaining negative coefficients for YOS variables due to the sharp drop in continuation rates after the 20-year point. Fiscal years 1980 and 1983 also were deleted due to unavailability of data. However, it is believed that the effect of missing data will be small.

Other data was obtained from the Turner effort on individual eligibility for the VSI/SSB and ACP Bonus programs. This information was used to calculate the percentage of a cohort that met the eligibility requirements for either the VSI/SSB or ACP bonus program. Data for unemployment rates for given years was also obtained. They were calculated for "white collar" workers as defined by the Bureau of Labor Statistics. Finally, data was obtained from the Future Aviation Professionals of America (FAPA) on the number of major airline hires for each year between 1977 and 1995. Major airline hires included all new hires by companies flying jet aircraft. This group includes major, national, and turbojet companies; smaller regional airlines flying propeller type aircraft are not included, however.

B. MODEL SPECIFICATION

The analysis used grouped data on aviator continuation rates. The other factors -- VSI/SSB, ACP, professional unemployment rates, and major airline hiring rates -- were used as explanatory variables. The relationship between these explanatory variables and the cohort continuation rates of Naval aviators was estimated using both a weighted grouped LOGIT and a unweighted grouped LOGIT estimation technique. The basic model specification is as follows:

Equation 1:

$$\begin{aligned} L = {} & \beta_0 + \beta_1 \text{ VSI/SSB} + \beta_2 \text{ACP} + \beta_3 \text{ AHR} + \beta_4 \text{ UNEMP} + \beta_5 \text{ MSR} \\ & + \beta_6 \text{ MSR}_{+1} + \beta_7 \text{ MSR}_{+2} + \beta_8 \text{ MSR}_{+3} \end{aligned}$$

Where, L is the LOGIT value which is defined as:

$$L = \ln[P_t / (1 - P_t)]$$

where the P_t's represent the continuation rates for a given cohort in a specified year t, β_0 is the intercept term, and the remaining β's represent the corresponding coefficients of the independent variables. The explanatory variables in Equation 1 are defined as follows:

1. VSI/SSB is the percentage of a cohort that meets eligibility requirements for the voluntary separation incentive (VSI) or special separation bonus (SSB);
2. ACP is the number of aviation continuation bonuses available to a cohort, defined as a percentage of the cohort;
3. AHR is the number of major airline hires for a given year t. A major airline is defined by the Future Aviation Professionals of America as being one of the international, national and turbojet companies flying jet aircraft. Regional airline hires are deleted. (FAPA, 1995);
4. UNEMP is the national white collar unemployment rate as reported by the Bureau of Labor Statistics;
5. MSR is a dummy variable for aviators with minimum service requirements completed (1 = yes, 0 = no);
6. MSR+1 is a dummy variable for aviators who have completed an additional year of active service above their minimum service requirement (1 = yes, 0 = no);
7. MSR+2 is a dummy variable for aviators who have completed two years of active service above their minimum service requirement (1 = yes, 0 = no);
8. MSR+3 is a dummy variable for aviators who have completed three years of active service above their minimum service requirement (1 = yes, 0 = no).

This specification was also estimated using a weighted grouped LOGIT to resolve the potential problem of heteroscadacity and to determine if variation in cohort size would bias the results. Basically, this was done by using a weighted term defined as:

$$w_i = N_i P_i (1 - P_i)$$

where N is the beginning inventory of a cohort for a given fiscal year, and P is the continuation rate for that same cohort in the given fiscal year. The final weighted grouped LOGIT model becomes:

Equation 2:

$$\sqrt{w_i}L = \sqrt{w_i}\beta_1 \text{ VSI / SSB} + \sqrt{w_i}\,\beta_2\text{ACP} + \sqrt{w_i}\,\beta_3\text{ AHR} + \sqrt{w_i}\beta_4\text{ UNEMP} + \sqrt{w_i}\beta_5\text{ MSR} + \sqrt{w_i}\beta_6\text{ MSR}_{+1} + \sqrt{w_i}\,\beta_7\text{ MSR}_{+2} + \sqrt{w_i}\,\beta_8\text{ MSR}_{+3}$$

As previously stated, in a second specification of Equations 1 and 2, a YOS variable was used in place of the MSR dummies. We would expect a positive coefficient for YOS because continuation rates tend to rise as a cohort ages.

The combined data set used in this thesis consisted of 539 grouped observations based on 27 cohorts (Year Groups 1960-1987) times 16 fiscal years (1977-1993). The aviation communities had 164, 208, and 167 observations for the helicopter, propeller and jet communities, respectively. Filters were placed to delete any cohorts with greater than 20 years of service to avoid skewed results due to drastic decreases in continuation rates caused by the majority of 20 year retirements. Cohorts with continuation rates of 1.0 were also deleted due to the infinite LOGIT values obtained in Equation 2.

The models were estimated separately for the three naval aviation communities: Jet, Propeller, and Helicopter. Additionally, a pooled model was estimated for the whole aviation community, and an F-test was conducted to determine whether any differences in the estimated coefficients among the communities were statistically significant.

The hypothesized relationships expected between continuation behavior and the explanatory variables are as follows:

1. VSI/SSB is hypothesized to have a negative effect on the continuation rate of naval aviators. This is due to the fact that the program is targeted as an incentive for members to leave the military and thus reduces the member's "cost of leaving."

2. ACP is hypothesized to have a positive effect on the continuation rate in line with its goal of increasing the manpower levels in various aviation communities in the Navy by increasing the officer's "cost of leaving."

3. AHR seems to have an ambiguous effect. As stated in the literature review, several studies have either confirmed or rejected that airline hiring rates have a detrimental effect on military aviator cohort survival rates. It is the contention of this author that an increase in airline hiring will reduce naval aviator continuation rates.

4. UNEMP is expected to have a direct positive relationship with continuation rates of naval aviators. When unemployment rates increase in the civilian sector, aviators are more likely to remain in the military because few jobs are available in the civilian sector.

5. MSR, MSR+1, MSR+2, MSR+3 are thought to have a negative effect on retention for two reasons. Initially, MSR equates to the first decision point when an aviatior's initial obligation expires. Historically, this has been the point where the greatest losses have occurred. Secondly, promotion to Lieutenant Commander occurs at the ten year mark in one's career. This is typically at the MSR+2 or MSR+3 mark depending on community type. If any of the minimum service requirement coefficients take on positive values it would be expected in the jet community for the variable MSR+3, since the majority of jet aviators reach the 10 year mark (promotion to O-4) at MSR+2 due to the extended length of flight training.

6. YOS is hypothesized to have a positive effect on retention. After the initial obligation expires at MSR and MSR+1, a steady increase in retention rates has historically been observed. This continues up to the 20-year point in one's career.

Six basic models for each airframe community were estimated using either weighted or unweighted variables, lagged or contemporaneous time dependent explanatory variables, and finally, either MSR or YOS variables. The goal is to observe which model yields the most accurate prediction of actual continuation rates. Upon estimation of a successful model, a spreadsheet tool will be devised to allow for specific inputs by users to forecast aviator continuation rates as a function of the various independent variables.

IV. STATISTICAL RESULTS

Results for the aviation community for both the estimated weighted and unweighted LOGIT models are presented in Tables 4.1 through 4.8. A model for all naval aviators is presented first in Tables 4.1 and 4.2, followed by separate models for each individual aviation community.

For each aviation community two models were estimated, a weighted and an unweighted LOGIT. According to Gujarati (1995), when discussing LOGIT estimating techniques on grouped data, he recommends the weighted least squares method be used to avoid heteroscadasticity. He states that the sample size must be "reasonably large" for each cell in order to obtain valid results. The grouped data used here pools cross-sectional and time series data. The weighted least squares estimates apply OLS techniques to the transformed (weighted) data, and the unweighted results apply OLS techniques to the original grouped data.

The data used can be found in Appendix A. The data set was compiled using an EXCEL spreadsheet program. Once raw data for year, year group, and continuation rates for each cohort was established for each observation, LOGIT values were calculated. Each observation was then supplied with values of the following for each aircraft community: VSI/SSB, ACP, AHR, UNEMP, MSR, MSR+1, MSR+2 and MSR+3 variables. Using the statistical package included in the EXCEL software, various OLS regressions could then be estimated.

A. RESULTS OF ESTIMATING GROUPED LOGIT MODELS FOR ALL NAVAL AVIATORS.

1. Weighted LOGIT Model Results

Table 4.1 displays the results of a pooled model for all aviation communities. The coefficients of ACP, unemployment rate, MSR , MSR+1 and MSR+2 dummy variables are all statistically significant. The coefficients of the

ACP and unemployment variables are both positive, verifying the hypothesized positive effect on continuation rates. The coefficients of the MSR dummy variables are negative, suggesting that retention is lower in the first three years after expriation of one's MSR. The coefficient of MSR+3 is also negative, but is significant only at the .10 significance level.

The VSI/SSB and AHR variables are not statistically significant. The negative coefficient for the VSI/SSB variable is in accord with the hypothesized effect of the separation bonus program on aviator retention. On the other hand, the positive coefficient of the airline hiring rate is the opposite to the hypothesized negative relationship.

Model performance was checked by comparing the percentage difference between predicted and actual continuation rates. The average difference between actual and predicted aviator retention rates using the weighted model for the combined aviator sample was 9.95 percent.

Table 4.1. Weighted LOGIT Results for all Naval Aviators (dependent variable = continuation rate)

VARIABLE	COEFFICIENT	t STATISTIC	P-VALUE
VSI/SSB	-0.1920	-1.2776	0.2019
ACP(bonus)	0.3879	3.0351	0.0025
Airline Hire Rate	$7.6256 \text{ X } 10^{6}$	0.9717	0.3316
Unemployment Rate	16.7079	14.0007	$4.0127 \text{ X } 10^{-38}$
MSR	-0.6320	-9.1050	$1.7516 \text{ X } 10^{-18}$
MSR+1	-0.6796	-9.8370	$4.3747 \text{ X } 10^{-21}$
MSR+2	-0.4080	-5.4350	$8.3696 \text{ X } 10^{-8}$
MSR+3	-0.1503	-1.7183	0.08632
INTERCEPT	3.5186	21.1817	$1.3280 \text{ X } 10^{-72}$
$R^2 = .3247$			
F = 31.8605			
N = 539			

Note: All bold variables are statistically significant

2. Unweighted LOGIT Model Results

Table 4.2 displays the results of a pooled model for all aviation communities using an unweighted LOGIT model estimated by OLS on the original grouped data. The VSI/SSB, ACP, AHR, unemployment rate, and all MSR dummy variables are significant. The coefficients of VSI/SSB and all MSR dummy variables are negative as hypothesized, while the coefficients of ACP, unemployment, and AHR variables are positive. All variables assumed the hypothesized signs for the coefficients except for AHR. AHR assumed a positive coefficient opposite to the hypothesized negative relationship on continuation rates.

When comparing actual and predicted continuation rates, the unweighted model performance (i.e., the difference between predicted and actual continuation rates) for the combined aviator sample dropped to a difference of only 5.39 percent. This equates to a 46 percent improvement over the weighted pooled aviator model.

Table 4.2. Unweighted LOGIT Results for All Naval Aviators (dependent variable = continuation rate)

VARIABLE	COEFFICIENT	t STATISTIC	P-VALUE
VSI/SSB	-0.8045	-3.9935	7.4311×10^{-5}
ACP(bonus)	0.53687	2.6087	0.0093
Airline Hire Rate	4.7652×10^{-5}	2.9552	.0033
Unemployment Rate	27.9275	7.4406	4.0716×10^{-13}
MSR	-1.6653	-13.5249	5.1241×10^{-36}
MSR+1	-1.5878	-12.9580	1.4883×10^{-33}
MSR+2	-0.9626	-7.8061	3.1704×10^{-14}
MSR+3	-0.3915	-3.2127	0.0014
COEFFICIENT	1.0479	3.5844	0.0004
$R^2 = .4309$			
F = 50.1671			
N = 539			

Note: All bold variables are statistically significant

B. RESULTS OF ESTIMATING SEPARATE LOGIT MODELS BY SPECIFIC AIRCRAFT TYPE

1. Helicopter Aviators

Table 4.3 summarizes the weighted grouped LOGIT model for helicopter aviators. When using a weighted grouped LOGIT for helicopter aviators, VSI/SSB, ACP, AHR, unemployment rate, MSR, MSR+2 and MSR+3 variables are all statistically significant. Both AHR and MSR dummy variables were positive. The positive coefficient of AHR again is counter to the hypothesized negative relationship. More interestingly, the MSR through MSR+3 variables assumed positive coefficients which would suggest a positive relationship between MSR year and continuation rates. Historically, we know this is not true, which brings into question the validity of this model. When comparing predicted with actual continuation rates for the weighted helicopter aviator model, an average 5.28 percent difference was found.

Table 4.3. Weighted LOGIT Results for All Helicopter Aviators (dependent variable = continuation rate)

VARIABLE	COEFFICIENT	t STATISTIC	P-VALUE
VSI/SSB	-.06578	-2.7533	0.0066
ACP(bonus)	0.4681	2.5088	0.0131
Airline Hire Rate	3.1172 X10^{-5}	2.5795	0.0108
Unemployment Rate	11.9084	5.4219	2.2186 X 10^{-7}
MSR	0.2729	2.2709	0.02453
MSR+1	0.2285	1.9025	0.0589
MSR+2	0.4594	3.7231	0.0003
MSR+3	0.4567	3.3174	.0011
INTERCEPT	3.1122	12.2765	2.3857 X 10^{-27}
$R^2 = .7391$			
F = 54.8856			
N = 164			

Note: All bold variables are statistically significant

Table 4.4 summarizes the unweighted LOGIT model for helicopter aviators. VSI/SSB, AHR, unemployment, and MSR through MSR+2 years were all statistically significant. The hypothesized signs were obtained for all variables with the exception of AHR, which was positive. ACP and MSR+3 variables were found to be statistically insignificant. This would suggest that the bonus program has a negligible effect on helicopter aviator retention.

The unweighted helicopter model yielded only a 3.08 percent difference between predicted and actual continuation rates. This amounts to a 42 percent improvement over the weighted helicopter model performance.

Table 4.4. Unweighted LOGIT Results for All Helicopter Aviators (dependent variable = continuation rate)

VARIABLE	COEFFICIENT	t STATISTIC	P-VALUE
VSI/SSB	-1.2384	-3.4036	0.0008
ACP(bonus)	0.5888	1.6801	0.0950
Airline Hire Rate	8.5654 X10^{-5}	3.1985	0.0017
Unemployment Rate	31.2584	4.9679	1.7704 X 10^{-6}
MSR	-1.0563	-5.1979	6.2743 X 10^{-7}
MSR+1	-1.1927	-5.9493	1.7279 X 10^{-8}
MSR+2	-0.6027	-2.9327	0.0039
MSR+3	-.0501	-0.2521	0.8013
INTERCEPT	0.8494	1.7322	0.8523
R^2 = .3780			
F=11.7764			
N = 164			

Note: All bold variables are statistically significant

2. Propeller Aviators

Table 4.5 depicts results obtained when modeling propeller aviators retention rates using a weighted grouped LOGIT estimation. ACP, unemployment rate, and MSR through MSR+3 dummy variables are all statistically significant. Although not significant, the VSI/SSB variable had a positive coefficient, contrary to the hypothesized negative relationship. AHR, which was not significant, had a positive coefficient. The average difference between the calculated weighted propeller model continuation rates and actual continuation rates was 13.38 percent.

Table 4.5. Weighted LOGIT Results for All Propeller Aviators

VARIABLE	COEFFICIENT	t STATISTIC	P-VALUE
VSI/SSB	0.0999	0.7213	0.4716
ACP(bonus)	0.4277	3.3678	0.0009
Airline Hire Rate	$1.5647 \text{ X} 10^{-6}$	0.1904	0.8492
Unemployment Rate	12.3856	8.7279	$1.4073 \text{ X } 10^{-15}$
MSR	-0.8430	-10.6735	$2.5558 \text{ X } 10^{-21}$
MSR+1	-0.8796	-11.3574	$2.2862 \text{ X } 10^{-23}$
MSR+2	-0.6406	-8.1946	$3.0217 \text{ X } 10^{-14}$
MSR+3	-0.3052	-3.4337	0.0007
INTERCEPT	5.1077	19.6866	$1.3473 \text{ X } 10^{-48}$
$R^2 = .4945$			
F = 24.3346			
N = 208			

Note: All bold variables are statistically significant

When using an unweighted grouped LOGIT estimation method for propeller aviators the unemployment rate and MSR through MSR+3 are statistically significant. However, neither VSI/SSB, ACP, or airline hiring rates were significant. The AHR variable was positive. All other variables coincided with their hypothesized relationship with continuation rates. The results can be seen in Table 4.6.

The performance of the unweighted propeller model was significantly better than the weighted version. When comparing the predicted continuation rates against the actual continuation rates for propeller aviators, the average error was found to be 4.32 percent in this model, which is much better than the 13.38 percent average error observed for the weighted propeller model.

Table 4.6. Unweighted LOGIT Results for All Propeller Aviators (dependent variable = continuation rate)

VARIABLE	COEFFICIENT	t STATISTIC	P-VALUE
VSI/SSB	-.1999	-0.8196	0.4134
ACP(bonus)	0.3250	1.2677	0.2064
Airline Hire Rate	1.9901 X10^{-5}	0.9714	0.3325
Unemployment Rate	21.0778	4.3547	2.1309 X 10^{-5}
MSR	-2.0914	-12.6734	2.2606 X 10^{-27}
MSR+1	-2.2441	-13.5204	5.6587 X 10^{-30}
MSR+2	-1.6676	-10.0871	1.3729 X 10^{-19}
MSR+3	-0.8834	-5.3715	2.1687 X 10^{-7}
Intercept	1.5732	4.1793	4.3773 X 10^{-5}
R^2 = .6694			
F=50.3602			
N = 208			

Note: All bold variables are statistically significant

3. Jet Aviators

Table 4.7 depicts weighted LOGIT results for Jet aviators. Among the statistically significant explanatory variables are VSI/SSB, unemployment rate, MSR and MSR+1 dummy variables. The MSR and MSR+1 dummy variables would suggest that Jet aviators are more likely to leave military service during those two particular years. Staying beyond MSR+1 years changes the hypothesized negative effect on retention to a positive relationship. Although AHR is insignificant, the variable has a coefficient in conjunction with the hypothesized relationship on continuation rates. The weighted model for jet aviators yielded an average 9.96 percent error when comparing predicted and actual continuation rates.

Table 4.8 contains results from an unweighted LOGIT estimation of Jet aviators. The coefficients of VSI/SSB, ACP, unemployment rate, and MSR through MSR+2 variables are all statistically significant. VSI/SSB and MSR dummy variables are negative as expected. ACP and unemployment rate are positively related to retention. The AHR variable is positive but is not significant.

Table 4.7. Weighted LOGIT Results for Jet Aviators (dependent variable = continuation rate)

VARIABLE	COEFFICIENT	t STATISTIC	P-VALUE
VSI/SSB	-1.0437	-3.5014	0.0006
ACP(bonus)	0.3213	1.5011	0.1353
Airline Hire Rate	-4.2583×10^{-6}	-0.3504	0.7265
Unemployment Rate	14.3960	7.1244	3.4934×10^{-11}
MSR	-0.4302	-3.7711	0.0002
MSR+1	-0.2347	-2.1111	0.0363
MSR+2	0.1121	0.9169	0.3606
MSR+3	0.1488	1.1325	0.2591
Intercept	3.1194	12.1888	1.640×10^{-24}
$R^2 = .4304$			
F=14.9230			
N = 167			

Note: All bold variables are statistically significant

MSR+3 was found to be insignificant. MSR+3, however, did have a negative coefficient. This would suggest that although MSR+3 has a negative relationship on jet aviator retention, the MSR+3 year is not a significant factor in jet community retention behavior.

The unweighted jet model yielded a 4.87 percent average error when comparing predicted and actual retention rates. This is roughly half the error exhibited by the weighted jet model.

Table 4.8. Unweighted LOGIT Results for Jet Aviators (dependent variable = continuation rate)

VARIABLE	COEFFICIENT	t STATISTIC	P-VALUE
VSI/SSB	-1.2388	-3.3542	0.0010
ACP(bonus)	0.8278	2.11968	0.0356
Airline Hire Rate	$4.3329\ \mathrm{X}10^{-5}$	1.4297	0.15478
Unemployment Rate	32.5125	4.7589	$4.3629\ \mathrm{X}\ 10^{-6}$
MSR	-1.8771	-8.5446	$3.0217\ \mathrm{X}\ 10^{-14}$
MSR+1	-1.3327	-6.1269	$6.8565\ \mathrm{X}\ 10^{-9}$
MSR+2	-0.5822	-2.6789	0.00817
MSR+3	-0.2524	-1.1610	0.2474
Intercept	0.6327	1.8667	0.2371
$R^2 = .4577$			
F = 16.6668			
N = 167			

Note: All bold variables are statistically significant

C. DISCUSSION OF MODEL PERFORMANCE

1. Predicted vs. Actual Retention rates

In comparing the model performance of the weighted and unweighted LOGIT estimating models, the two models were used to predict continuation rates using a spreadsheet program. These predicted retention rates were then compared to actual retention rates, and the percentage difference between the predicted continuation and actual rates for a given cohort in a specific fiscal year was calculated. The percentage differences were then averaged for each community. Table 4.9 below compares the errors of the weighted and unweighted models. The unweighted LOGIT results appear to provide the most accurate predictions of aviation continuation rates. In most cases, the percentage error is less than 5 percent for the unweighted OLS estimates.

Table 4.9. Differences In Predicted vs. Actual Continuation Rates From Weighted and Unweighted LOGIT Estimation Models

MODEL	WEIGHTED LOGIT MODELS	UNWEIGHTED LOGIT MODELS
ALL AVIATORS	9.95 %	5.39 %
HELICOPTER AVIATORS	5.28 %	3.08 %
PROPELLER AVIATORS	13.38 %	4.32 %
JET AVIATORS	9.96 %	4.87 %

Observing the relationship of the coefficients with their hypothesized sign also supported the use of the unweighted LOGIT estimation technique. For example, when estimating helicopter retention, the coefficients for MSR should be negative. Since this will be the end of obligated service, the aviator will be more likely to leave the service at this point than at any other time. Table 4.3 shows that the MSR variable in the weighted LOGIT model is statistically significant, but it has a positive relationship with retention. Another anomaly can be seen in Table 4.5 in the case of propeller pilots. We know from previous studies (Mehay and Hogan, 1995) that VSI/SSB should have a negative effect, since the goal of the program is to induce the people to leave military service. However, the weighted LOGIT estimation for propeller aviators yields a positive relationship. We conclude that the unweighted LOGIT models provide more accurate predictions of retention and more plausible signs of the estimated coefficients.

Each of the weighted LOGIT estimation results for each community can be found in Appendix B. The EXCEL statistical results are listed in Appendix B, which displays R-square values, number of observations, F-values, coefficients and other pertinent results for each of the model runs.

2. Goodness of Fit: R Square and F - Values

The coefficient of determination is used to measure goodness of fit for a given regression model. The F- test is used to test the null hypothesis that all coefficients are simultaneously equal to zero. Table 4.13 summarizes the R^2 and F - values from the unweighted LOGIT models.

Table 4.10. Acquired R^2 and F-Values for LOGIT Estimations

MODEL	R^2	F -value
ALL AVIATORS	.4309	50.1671
HELICOPTER AVIATORS	.3780	11.7764
PROPELLER AVIATORS	.6694	50.3602
JET AVIATORS	.4577	16.6668

As seen in Table 4.10, the R^2 values obtained for each of the models are of a reasonable magnitude in explaining the proportion of the total variation in the dependent variable. The calculated F-value was compared to the critical F-value (at the .05 level of significance). In order to reject the null hypothesis, the calculated F-value must be greater than the critical F-value. The greatest critical F-value obtained for any of the models was 2.09. As can be seen from Table 4.10 the calculated F-value is larger than the critical-F for each model. Thus, the null hypothesis can be rejected for all of the models.

D. DISCUSSION OF THE EXPLANATORY VARIABLES

1. Voluntary Separation Incentive/Selective Separation Bonus (VSI/SSB)

The VSI/SSB variable was significant in all but the propeller community. When all communities are grouped together, the average effect of VSI/SSB is also statistically significant. The coefficient obtained for each group was negative, thus confirming the hypothesized negative relationship with retention rates. Table 4.11 represents the effects of a hypothetical increase in the proportion of personnel eligible for VSI/SSB by 10 percentage points. For example, if 50 percent of a cohort is currently offered participation in the VSI/SSB program, the effects of increasing the eligibility to 60 percent of a cohort are as listed in Table 4.11.

Table 4.11. The Effects of Increasing the Proportion Eligible for the VSI/SSB Program by 10%

COMMUNITY	CHANGE IN RETENTION
ALL AVIATORS	**-0.6 %**
HELICOPTER AVIATORS	**-0.7 %**
PROPELLER AVIATORS	**-0.2 %**
JET AVIATORS	**-1.09 %**

The ACP program variable is statistically significant in the pooled aviator sample. However, in the separate models for each individual aviation community, ACP was statistically significant only for the Jet community. All coefficients were positive, thus supporting the positive effect of the bonus on continuation rates. Table 4.12 represents the effects of a hypothetical increase in the proportion of personnel eligible for the ACP bonus program by 10 percentage points.

Table 4.12. The Effects of Increasing the Proportion Eligible for the ACP Program by 10%

COMMUNITY	CHANGE IN RETENTION
ALL AVIATORS	**+0.4 %**
HELICOPTER AVIATORS	**+0.4 %**
PROPELLER AVIATORS	**+0.3 %**
JET AVIATORS	**+0.7 %**

2. Airline Hiring Rate (AHR)

The AHR variable proved to be statistically significant in the combined aviator sample. However, in the model estimates for the individual communities, AHR was statistically significant only for helicopter aviators. All coefficients for AHR are positively related to retention rates, which is counter to the expected relationship. As stated earlier in Chapter II, this same relationship was found in a RAND (1995) report on the effects of airline hiring on military aviator retention rates. One possible explanation for this result could be the scope of time involved for the data used. In 1978 the airline industry was de-regulated, which caused a large spike in airline pilot hires (see Figure 2, above). This in turn may have influenced the overall relationship of airline hiring rates on aviator retention rates during the 1977 to 1993 period.

3. Unemployment Rate

Of all the explanatory variables, the professional unemployment rate had the largest impact on naval aviator retention rates. Unemployment rates were statistically significant for each individual aviation community and also in the combined aviator sample. The unemployment rate was positively related to continuation rates, as hypothesized. Table 4.13 represents the change in aviator retention rates for a given additional increase of 1 percentage point in the unemployment rate.

Table 4.13. The Effects of an Increase in the Unemployment Rate of 1 Percentage Point

COMMUNITY	CHANGE IN RETENTION
ALL AVIATORS	+ 2.3 %
HELICOPTER AVIATORS	+ 1.9 %
PROPELLER AVIATORS	+ 2.0%
JET AVIATORS	+ 3.0%

V. CONCLUSION

This thesis examined the relationship of various internal policies and external economic factors on grouped Naval aviator continuation rates. The data base contained 539 pooled observations for cohorts from year groups 1960 to 1987 for fiscal years 1977 to 1993. Both weighted and unweighted grouped LOGIT estimation techniques were employed to determine which factors played key roles. Additionally, the estimations were conducted initially for all combined aviators and then separately for each aviation community.

It was found that the unweighted LOGIT models yielded the best results in predicting continuation rates for each of the above categories. Each unweighted model predicted the mean aviator continuation rate within 5 percent of the actual value for each category.

In the pooled samples, VSI/SSB, ACP, airline hiring rate, unemployment rate, and MSR through MSR+1 dummy variables were all statistically significant. The airline hiring rate variable was the only variable which did not have the hypothesized effect on continuation rates. Airline hiring rate exhibited a positive relationship with aviator continuation rates in all cases. This could be due to the large sudden increase in airline hires during the airline deregulation of 1978. This possibly influenced the overall relationship of airline hiring rates on naval aviator continuation rates.

The variable with the greatest effect on naval aviator continuation was the unemployment rate for professional workers. Unemployment rates were consistently significant and positively related to continuation rates across all communities. A one percentage point increase in the unemployment rate led to a 2.3 percent increase in continuation rates for the combined aviator sample. The one percentage point increase in the unemployment rate also equated to increases of 1.9, 2.0, and 3.0 percent increases in continuation rates for the helicopter, propeller and jet communities, respectively.

The effect of the VSI/SSB program was significant in all but the propeller community. An increase of 10 percentage points in the proportion eligibile for the VSI/SSB program generated a decrease of 0.6 percent in continuation rates for the combined aviator model. This same increase in eligibility produced decreases of 0.7, 0.2, and 1.09 percent in continuation rates for the helicopter, propeller and jet communities, respectively.

The ACP bonus program displayed a positive relationship with continuation rates. A 10 percentage point increase in the proportion of aviators eligible for ACP yielded a 0.4 percent increase in continuation rates for the pooled aviator sample. This same 10 percentage point increase had a 0.4, 0.3 and a 0.7 percent increase in continuation rates for the helicopter, propeller and jet communities, respectively.

A. RECOMMENDATIONS

Future research should include data compiled on aviator retention since 1993. This would increase the amount of data for years in which the military drawdown was taking place. One area of concern was the effect of the airline hiring rate. Although airline hiring did not play a major role in the grouped retention data used here, a more thorough analysis should be conducted. One possible avenue would be to try to eliminate the effect of the Airline Deregulation Act of 1978. This could be done by interpolating hypothetical airline hiring rates for the years 1978 and 1979. This would "smooth" the airline hiring profile from 1977 to 1980 in order to avoid the sharp increase in hires that occurred due to deregulation.

B. SUMMARY

Using the data supplied in Appendix A, the aviation community manager can now take the grouped data supplied and manipulate it in various ways with relative ease using the EXCEL statistical package. Additionally, one can use the coefficients and intercepts obtained from the unweighted models presented in Appendix B and predict future aviator continuation rates. This can be accomplished very easily using EXCEL or any other spreadsheet software package with a statistics capability.

Being able to interpret trends in naval aviator continuation rates is critical to aviation program mangers. The analysis in this thesis provides an important tool in understanding the effects of various internal Navy policies and external economic factors on aviator continuation rates. It will be even more important in the future with an emphasis on a lean force structure to be able to adjust compensation policies in connection with given external labor market forces and predict future aviator continuation rates.

APPENDIX A. STATISTICAL DATA

Pages 36-49 list the grouped data used in the LOGIT models. The variables are defined as follows:

YR	Fiscal year of observation
YG	Year of Commissioning
YOS	Years of active duty service completed
CR	Continuation rate
LOGIT	Calculated LOGIT value
HELO	Dummy variable for helicopter aviator
JET	Dummy variable for jet aviator
PROP	Dummy variable for propeller aviator
AHR	Airline hiring rate
LAG	Airline hiring rate lagged one year(YR-1)
UNEMP	White collar unemployment rate
LAG	White collar unemployment rate lagged one year (YR-1)
VSI/SSB	Percent of a cohort eligible for VSI/SSB program
ACP	Percent of a cohort eligible for ACP program
MSR	Dummy variable to signify cohort has completed minimum service requirement
MSR+1	Dummy variable to signify cohort has completed one but less than two years of service above minimum service requirement.
MSR+2	Dummy variable to signify cohort has completed two but less than three years of service above minimum service requirement.
MSR+3	Dummy variable to signify cohort has completed three but less than four years of service above minimum service requirement.
N	Number of observations in cohort

#OBS	YR	YG	YOS	CR	1 - CR	LOGIT VALUE	HELO	JET	PROP	AHR	LAG	UNEMP	LAG	VSI/SSB	ACP	MSR	MSR+1	MSR+2	MSR+3	N
1	77	71	6	0.9152	0.0848	2.378847078	1	0	0	1446	547	0.071	0.073	0	0	1	0	0	0	165
2	77	70	7	0.898	0.102	2.175197255	1	0	0	1446	547	0.071	0.073	0	0	0	1	0	0	245
3	77	69	8	0.9435	0.0565	2.815355727	1	0	0	1446	547	0.071	0.073	0	0	0	0	1	0	124
4	77	68	9	0.9787	0.0213	3.827518088	1	0	0	1446	547	0.071	0.073	0	0	0	0	0	1	94
5	77	67	10	0.957	0.043	3.102603276	1	0	0	1446	547	0.071	0.073	0	0	0	0	0	0	93
6	77	66	11	0.9851	0.0149	4.191381946	1	0	0	1446	547	0.071	0.073	0	0	0	0	0	0	67
7	77	61	16	0.9677	0.0323	3.399854892	1	0	0	1446	547	0.071	0.073	0	0	0	0	0	0	31
8	77	60	17	0.9778	0.0222	3.785212861	1	0	0	1446	547	0.071	0.073	0	0	0	0	0	0	45
9	73	70	8	0.8991	0.1009	2.187264336	1	0	0	3550	1446	0.061	0.066	0	0	0	0	1	0	218
10	78	72	6	0.7972	0.2028	1.368885317	1	0	0	3550	1446	0.061	0.066	0	0	1	0	0	0	218
11	78	71	7	0.8827	0.1173	2.018250636	1	0	0	3550	1446	0.061	0.066	0	0	0	1	0	0	162
12	78	69	9	0.931	0.069	2.602152773	1	0	0	3550	1446	0.061	0.066	0	0	0	0	0	1	116
13	78	68	10	0.963	0.037	3.259135499	1	0	0	3550	1446	0.061	0.066	0	0	0	0	0	0	81
14	78	67	11	0.9398	0.0602	2.747994734	1	0	0	3550	1446	0.061	0.066	0	0	0	0	0	0	83
15	78	66	12	0.9851	0.0149	4.191381946	1	0	0	3550	1446	0.061	0.066	0	0	0	0	0	0	67
16	78	63	15	0.9714	0.0286	3.525331612	1	0	0	3550	1446	0.061	0.066	0	0	0	0	0	0	35
17	78	62	16	0.9697	0.0303	3.465839033	1	0	0	3550	1446	0.061	0.066	0	0	0	0	0	0	33
18	78	61	17	0.9667	0.0333	3.368330812	1	0	0	3550	1446	0.061	0.066	0	0	0	0	0	0	30
19	78	60	18	0.9318	0.0682	2.614673635	1	0	0	3550	1446	0.061	0.066	0	0	0	0	0	0	44
20	79	71	8	0.9091	0.0909	2.302695098	1	0	0	3271	3550	0.058	0.056	0	0	0	0	1	0	132
21	79	72	7	0.875	0.125	1.945910149	1	0	0	3271	3550	0.058	0.056	0	0	0	1	0	0	136
22	79	73	6	0.8014	0.1986	1.395067447	1	0	0	3271	3550	0.058	0.056	0	0	1	0	0	0	146
23	79	70	9	0.9348	0.0652	2.662873134	1	0	0	3271	3550	0.058	0.056	0	0	0	0	0	1	184
24	79	69	10	0.9519	0.0481	2.98517781	1	0	0	3271	3550	0.058	0.056	0	0	0	0	0	0	104
25	79	68	11	0.9118	0.0882	2.335813705	1	0	0	3271	3550	0.058	0.056	0	0	0	0	0	0	68
26	79	67	12	0.9865	0.0135	4.29147364	1	0	0	3271	3550	0.058	0.056	0	0	0	0	0	0	74
27	79	66	13	0.9677	0.0323	3.399854892	1	0	0	3271	3550	0.058	0.056	0	0	0	0	0	0	62
28	79	63	16	0.9394	0.0606	2.740946481	1	0	0	3271	3550	0.058	0.056	0	0	0	0	0	0	33
29	79	62	17	0.9688	0.0312	3.435640097	1	0	0	3271	3550	0.058	0.056	0	0	0	0	0	0	32
30	79	60	19	0.95	0.05	2.944438979	1	0	0	3271	3550	0.058	0.056	0	0	0	0	0	0	40
31	81	73	8	0.9106	0.0894	2.320983041	1	0	0	1116	750	0.076	0.069	0	0.63	0	0	1	0	123
32	81	74	7	0.9126	0.0874	2.345802386	1	0	0	1116	750	0.076	0.069	0	0.55	0	1	0	0	183
33	81	75	6	0.8862	0.1138	2.052500137	1	0	0	1116	750	0.076	0.069	0	0.47	1	0	0	0	123
34	81	72	9	0.9304	0.0696	2.592850034	1	0	0	1116	750	0.076	0.069	0	0.75	0	0	0	1	115
35	81	71	10	0.9352	0.0648	2.669454807	1	0	0	1116	750	0.076	0.069	0	0.73	0	0	0	0	108
36	81	70	11	0.9863	0.0137	4.276564735	1	0	0	1116	750	0.076	0.069	0	0.66	0	0	0	0	146
37	81	68	13	0.9692	0.0308	3.448956299	1	0	0	1116	750	0.076	0.069	0	0.78	0	0	0	0	65
38	81	66	15	0.9861	0.0139	4.261868929	1	0	0	1116	750	0.076	0.069	0	0.74	0	0	0	0	72
39	81	65	16	0.9783	0.0217	3.808504111	1	0	0	1116	750	0.076	0.069	0	0.55	0	0	0	0	46
40	81	64	17	0.9355	0.0645	2.674415922	1	0	0	1116	750	0.076	0.069	0	0.09	0	0	0	0	31

#OBS	YR	YG	YOS	CR	1 - CR	LOGIT VALUE	HELO	JET	PROP	AHR	LAG	UNEMP	LAG	VSI/SSB	ACP	MSR	MSR+1	MSR+2	MSR+3	N
41	81	63	18	0.9667	0.0333	3.368330812	1	0	0	1116	750	0.076	0.069	0	0	0	0	0	0	30
42	81	62	19	0.9	0.1	2.197224577	1	0	0	1116	750	0.076	0.069	0	0	0	0	0	0	30
43	82	74	8	0.9625	0.0375	3.245193133	1	0	0	1050	1116	0.097	0.073	0	0.46	0	0	1	0	160
44	82	75	7	0.9554	0.0446	3.064396242	1	0	0	1050	1116	0.097	0.073	0	0.48	0	1	0	0	112
45	82	76	6	0.9661	0.0339	3.349852334	1	0	0	1050	1116	0.097	0.073	0	0.48	1	0	0	0	59
46	82	73	9	0.9487	0.0513	2.917401874	1	0	0	1050	1116	0.097	0.073	0	0.38	0	0	0	1	117
47	82	72	10	0.9806	0.0194	3.922891563	1	0	0	1050	1116	0.097	0.073	0	0.34	0	0	0	0	103
48	82	71	11	0.9505	0.0495	2.955015492	1	0	0	1050	1116	0.097	0.073	0	0.42	0	0	0	0	101
49	82	70	12	0.9854	0.0146	4.212026121	1	0	0	1050	1116	0.097	0.073	0	0.37	0	0	0	0	137
50	82	68	14	0.9833	0.0167	4.075505542	1	0	0	1050	1116	0.097	0.073	0	0.39	0	0	0	0	60
51	82	66	16	0.9859	0.0141	4.247380132	1	0	0	1050	1116	0.097	0.073	0	0.1	0	0	0	0	71
52	82	65	17	0.9362	0.0638	2.686075939	1	0	0	1050	1116	0.097	0.073	0	0	0	0	0	0	47
53	82	64	18	0.8667	0.1333	1.872090669	1	0	0	1050	1116	0.097	0.073	0	0	0	0	0	0	30
54	82	63	19	0.9286	0.0714	2.565380206	1	0	0	1050	1116	0.097	0.073	0	0	0	0	0	0	28
55	84	76	8	0.9344	0.0656	2.656328916	1	0	0	5465	2552	0.075	0.092	0	0.38	0	0	1	0	61
56	84	77	7	0.9463	0.0537	2.869146642	1	0	0	5465	2552	0.075	0.092	0	0.53	0	1	0	0	149
57	84	78	6	0.9515	0.0485	2.976475889	1	0	0	5465	2552	0.075	0.092	0	0.09	1	0	0	0	103
58	84	75	9	0.98	0.02	3.891820298	1	0	0	5465	2552	0.075	0.092	0	0.02	0	0	0	1	100
59	84	74	10	0.9923	0.0077	4.858805152	1	0	0	5465	2552	0.075	0.092	0	0.01	0	0	0	0	130
60	84	73	11	0.9462	0.0538	2.867180496	1	0	0	5465	2552	0.075	0.092	0	0	0	0	0	0	93
61	84	72	12	0.9885	0.0115	4.453841607	1	0	0	5465	2552	0.075	0.092	0	0	0	0	0	0	87
62	84	71	13	0.9556	0.0444	3.069099946	1	0	0	5465	2552	0.075	0.092	0	0	0	0	0	0	90
63	84	70	14	0.9919	0.0081	4.807758234	1	0	0	5465	2552	0.075	0.092	0	0	0	0	0	0	123
64	84	68	16	0.9815	0.0185	3.971311282	1	0	0	5465	2552	0.075	0.092	0	0	0	0	0	0	54
65	84	66	18	0.9714	0.0286	3.525331612	1	0	0	5465	2552	0.075	0.092	0	0	0	0	0	0	70
66	84	65	19	0.95	0.05	2.944438979	1	0	0	5465	2552	0.075	0.092	0	0	0	0	0	0	40
67	85	77	8	0.9457	0.0543	2.857401167	1	0	0	7840	5465	0.072	0.071	0	0	0	0	1	0	129
68	85	78	7	0.9308	0.0692	2.599043569	1	0	0	7840	5465	0.072	0.071	0	0.18	0	1	0	0	159
69	85	79	6	0.981	0.019	3.94413348	1	0	0	7840	5465	0.072	0.071	0	0.02	1	0	0	0	158
70	85	76	9	0.963	0.037	3.259135499	1	0	0	7840	5465	0.072	0.071	0	0	0	0	0	1	54
71	85	74	11	0.9922	0.0078	4.845800966	1	0	0	7840	5465	0.072	0.071	0	0	0	0	0	0	129
72	85	73	12	0.9495	0.0505	2.933962194	1	0	0	7840	5465	0.072	0.071	0	0	0	0	0	0	99
73	85	72	13	0.9885	0.0115	4.453841607	1	0	0	7840	5465	0.072	0.071	0	0	0	0	0	0	87
74	85	71	14	0.9775	0.0225	3.771482983	1	0	0	7840	5465	0.072	0.071	0	0	0	0	0	0	89
75	85	70	15	0.9925	0.0075	4.885323992	1	0	0	7840	5465	0.072	0.071	0	0	0	0	0	0	134
76	85	68	17	0.9841	0.0159	4.125408409	1	0	0	7840	5465	0.072	0.071	0	0	0	0	0	0	63
77	85	66	19	0.8955	0.1045	2.14819515	1	0	0	7840	5465	0.072	0.071	0	0	0	0	0	0	67
78	86	78	8	0.8992	0.1008	2.188367124	1	0	0	6341	7840	0.07	0.068	0	0.02	0	1	0	0	129
79	86	79	7	0.9122	0.0878	2.340797764	1	0	0	6341	7840	0.07	0.068	0	0.29	1	0	0	0	148
80	86	77	9	0.9714	0.0286	3.525331612	1	0	0	6341	7840	0.07	0.068	0	0	0	0	1	0	105

#OBS	YR	YG	YOS	CR	1 - CR	LOGIT VALUE	HELO	JET	PROP	AHR	LAG	UNEMP	LAG	VSI/SSB	ACP	MSR	MSR+1	MSR+2	MSR+3	N
81	86	76	10	0.9565	0.0435	3.090519851	1	0	0	6341	7840	0.07	0.068	0	0	0	0	0	1	46
82	86	75	11	0.963	0.037	3.259135499	1	0	0	6341	7840	0.07	0.068	0	0	0	0	0	0	81
83	86	74	12	0.973	0.027	3.584547216	1	0	0	6341	7840	0.07	0.068	0	0	0	0	0	0	111
84	86	73	13	0.9259	0.0741	2.525350705	1	0	0	6341	7840	0.07	0.068	0	0	0	0	0	0	81
85	86	72	14	0.9873	0.0127	4.353371951	1	0	0	6341	7840	0.07	0.068	0	0	0	0	0	0	79
86	86	71	15	0.9765	0.0235	3.726974329	1	0	0	6341	7840	0.07	0.068	0	0	0	0	0	0	85
87	86	70	16	0.9914	0.0086	4.747355882	1	0	0	6341	7840	0.07	0.068	0	0	0	0	0	0	116
88	86	68	18	0.9592	0.0408	3.157417522	1	0	0	6341	7840	0.07	0.068	0	0	0	0	0	0	49
89	86	67	19	0.9333	0.0667	2.63852174	1	0	0	6341	7840	0.07	0.068	0	0	0	0	0	0	75
90	87	79	8	0.9386	0.0614	2.726979568	1	0	0	7010	6341	0.062	0.066	0	0.07	0	1	0	0	114
91	87	80	7	0.9435	0.0565	2.815355727	1	0	0	7010	6341	0.062	0.066	0	0.25	1	0	0	0	124
92	87	78	9	0.9778	0.0222	3.785212861	1	0	0	7010	6341	0.062	0.066	0	0	0	0	1	0	90
93	87	77	10	0.975	0.025	3.663561646	1	0	0	7010	6341	0.062	0.066	0	0.01	0	0	0	1	80
94	87	76	11	0.9474	0.0526	2.891005271	1	0	0	7010	6341	0.062	0.066	0	0.03	0	0	0	0	38
95	87	74	13	0.9902	0.0098	4.615524557	1	0	0	7010	6341	0.062	0.066	0	0	0	0	0	0	102
96	87	73	14	0.9459	0.0541	2.861302669	1	0	0	7010	6341	0.062	0.066	0	0	0	0	0	0	74
97	87	72	15	0.9863	0.0137	4.276564735	1	0	0	7010	6341	0.062	0.066	0	0	0	0	0	0	73
98	87	71	16	0.974	0.026	3.623314766	1	0	0	7010	6341	0.062	0.066	0	0	0	0	0	0	77
99	87	70	17	0.99	0.01	4.59511985	1	0	0	7010	6341	0.062	0.066	0	0	0	0	0	0	100
100	87	69	18	0.9872	0.0128	4.345427482	1	0	0	7010	6341	0.062	0.066	0	0	0	0	0	0	78
101	87	68	19	0.8043	0.1957	1.41338946	1	0	0	7010	6341	0.062	0.066	0	0	0	0	0	0	46
102	88	80	8	0.9052	0.0948	2.256386504	1	0	0	6683	7010	0.055	0.058	0	0.05	0	1	0	0	116
103	88	81	7	0.8971	0.1029	2.165409696	1	0	0	6683	7010	0.055	0.058	0	0.25	1	0	0	0	243
104	88	78	10	0.961	0.039	3.204412763	1	0	0	6683	7010	0.055	0.058	0	0.03	0	0	0	1	77
105	88	77	11	0.9851	0.0149	4.191381946	1	0	0	6683	7010	0.055	0.058	0	0	0	0	0	0	67
106	88	76	12	0.9355	0.0645	2.674415922	1	0	0	6683	7010	0.055	0.058	0	0	0	0	0	0	31
107	88	73	15	0.9365	0.0635	2.691109616	1	0	0	6683	7010	0.055	0.058	0	0	0	0	0	0	63
108	88	72	16	0.9796	0.0204	3.871609424	1	0	0	6683	7010	0.055	0.058	0	0	0	0	0	0	49
109	88	71	17	0.9667	0.0333	3.368330812	1	0	0	6683	7010	0.055	0.058	0	0	0	0	0	0	60
110	88	70	18	0.9846	0.0154	4.157867958	1	0	0	6683	7010	0.055	0.058	0	0	0	0	0	0	65
111	88	69	19	0.9107	0.0893	2.322212047	1	0	0	6683	7010	0.055	0.058	0	0	0	0	0	0	56
112	89	81	8	0.8738	0.1262	1.934983566	1	0	0	9026	6683	0.053	0.052	0	0.01	0	1	0	0	206
113	89	82	7	0.8659	0.1341	1.865183638	1	0	0	9026	6683	0.053	0.052	0	0.02	1	0	0	0	179
114	89	80	9	0.9583	0.0417	3.134659753	1	0	0	9026	6683	0.053	0.052	0	0	0	0	1	0	96
115	89	79	10	0.988	0.012	4.410776048	1	0	0	9026	6683	0.053	0.052	0	0	0	0	0	1	83
116	89	78	11	0.9455	0.0545	2.853513186	1	0	0	9026	6683	0.053	0.052	0	0	0	0	0	0	55
117	89	76	13	0.9643	0.0357	3.296251761	1	0	0	9026	6683	0.053	0.052	0	0	0	0	0	0	28
118	89	75	14	0.9811	0.0189	3.949512469	1	0	0	9026	6683	0.053	0.052	0	0	0	0	0	0	53
119	89	74	15	0.9697	0.0303	3.465839033	1	0	0	9026	6683	0.053	0.052	0	0	0	0	0	0	66
120	89	73	16	0.9286	0.0714	2.565380206	1	0	0	9026	6683	0.053	0.052	0	0	0	0	0	0	56

#OBS	YR	YG	YOS	CR	1 - CR	LOGIT VALUE	HELO	JET	PROP	AHR	LAG	UNEMP	LAG	VSI/SSB	ACP	MSR	MSR+1	MSR+2	MSR+3	N
121	89	72	17	0.9756	0.0244	3.688469534	1	0	0	9026	6683	0.053	0.052	0	0	0	0	0	0	41
122	89	71	18	0.9464	0.0536	2.871116245	1	0	0	9026	6683	0.053	0.052	0	0	0	0	0	0	56
123	89	70	19	0.8571	0.1429	1.791409513	1	0	0	9026	6683	0.053	0.052	0	0	0	0	0	0	56
124	90	82	8	0.8671	0.1329	1.875557345	1	0	0	4779	9026	0.055	0.05	0	0.1	0	1	0	0	158
125	90	83	7	0.8533	0.1467	1.7607215	1	0	0	4779	9026	0.055	0.05	0	0.36	1	0	0	0	184
126	90	81	9	0.9301	0.0699	2.588226458	1	0	0	4779	9026	0.055	0.05	0	0.05	0	0	1	0	186
127	90	80	10	0.9859	0.0141	4.247380132	1	0	0	4779	9026	0.055	0.05	0	0.03	0	0	0	1	71
128	90	79	11	0.9859	0.0141	4.247380132	1	0	0	4779	9026	0.055	0.05	0	0.01	0	0	0	0	71
129	90	78	12	0.9545	0.0455	3.043475317	1	0	0	4779	9026	0.055	0.05	0	0	0	0	0	0	44
130	90	77	13	0.9444	0.0556	2.832366604	1	0	0	4779	9026	0.055	0.05	0	0	0	0	0	0	54
131	90	76	14	0.963	0.037	3.259135499	1	0	0	4779	9026	0.055	0.05	0	0	0	0	0	0	27
132	90	75	15	0.9412	0.0588	2.773013802	1	0	0	4779	9026	0.055	0.05	0	0	0	0	0	0	51
133	90	74	16	0.9677	0.0323	3.399854892	1	0	0	4779	9026	0.055	0.05	0	0	0	0	0	0	62
134	90	73	17	0.9259	0.0741	2.525350705	1	0	0	4779	9026	0.055	0.05	0	0	0	0	0	0	54
135	90	72	18	0.95	0.05	2.944438979	1	0	0	4779	9026	0.055	0.05	0	0	0	0	0	0	40
136	91	83	8	0.8473	0.1527	1.713579611	1	0	0	4004	4779	0.067	0.053	0	0.01	0	1	0	0	131
137	91	84	7	0.8431	0.1569	1.681476915	1	0	0	4004	4779	0.067	0.053	0	0.27	1	0	0	0	153
138	91	82	9	0.9344	0.0656	2.656328916	1	0	0	4004	4779	0.067	0.053	0	0.03	0	0	1	0	122
139	91	81	10	0.9576	0.0424	3.117281792	1	0	0	4004	4779	0.067	0.053	0	0.03	0	0	0	1	118
140	91	80	11	0.9545	0.0455	3.043475317	1	0	0	4004	4779	0.067	0.053	0	0	0	0	0	0	44
141	91	79	12	0.9444	0.0556	2.832366604	1	0	0	4004	4779	0.067	0.053	0	0	0	0	0	0	36
142	91	78	13	0.7576	0.2424	1.139566288	1	0	0	4004	4779	0.067	0.053	0	0	0	0	0	0	33
143	91	76	15	0.9	0.1	2.197224577	1	0	0	4004	4779	0.067	0.053	0	0	0	0	0	0	10
144	91	74	17	0.8621	0.1379	1.832842488	1	0	0	4004	4779	0.067	0.053	0	0	0	0	0	0	29
145	91	73	18	0.8519	0.1481	1.749581428	1	0	0	4004	4779	0.067	0.053	0	0	0	0	0	0	27
146	91	72	19	0.9167	0.0833	2.398331716	1	0	0	4004	4779	0.067	0.053	0	0	0	0	0	0	24
147	92	84	8	0.7638	0.2362	1.173627071	1	0	0	2607	4004	0.074	0.065	0	0.06	0	1	0	0	127
148	92	85	7	0.8357	0.1643	1.626575672	1	0	0	2607	4004	0.074	0.065	0	0.23	1	0	0	0	213
149	92	83	9	0.9316	0.0684	2.611530713	1	0	0	2607	4004	0.074	0.065	0	0.03	0	0	1	0	117
150	92	79	13	0.9697	0.0303	3.465839033	1	0	0	2607	4004	0.074	0.065	0	0	0	0	0	1	33
151	92	78	14	0.9583	0.0417	3.134659753	1	0	0	2607	4004	0.074	0.065	0	0	0	0	0	0	24
152	92	76	16	0.9	0.1	2.197224577	1	0	0	2607	4004	0.074	0.065	0	0	0	0	0	0	10
153	92	74	18	0.9615	0.0385	3.217836324	1	0	0	2607	4004	0.074	0.065	0	0	0	0	0	0	26
154	92	73	19	0.92	0.08	2.442347035	1	0	0	2607	4004	0.074	0.065	0	0	0	0	0	0	25
155	93	85	8	0.7606	0.2394	1.155971802	1	0	0	2067	2607	0.068	0.071	0.17	0.01	0	1	0	0	188
156	93	86	7	0.9036	0.0964	2.237880583	1	0	0	2067	2607	0.068	0.071	0.59	0	1	0	0	0	280
157	93	84	9	0.783	0.217	1.283235342	1	0	0	2067	2607	0.068	0.071	0.15	0	0	0	1	0	106
158	93	83	10	0.8515	0.1485	1.746414542	1	0	0	2067	2607	0.068	0.071	0.17	0	0	0	0	1	101
159	93	82	11	0.961	0.039	3.204412763	1	0	0	2067	2607	0.068	0.071	0.04	0.01	0	0	0	0	77
160	93	81	12	0.9762	0.0238	3.713981903	1	0	0	2067	2607	0.068	0.071	0.57	0	0	0	0	0	84

#OBS	YR	YG	YOS	CR	1 - CR	LOGIT VALUE	HELO	JET	PROP	AHR	LAG	UNEMP	LAG	VSI/SSB	ACP	MSR	MSR+1	MSR+2	MSR+3	N
161	93	79	14	0.9167	0.0833	2.398331716	1	0	0	2067	2607	0.068	0.071	0.82	0	0	0	0	0	24
162	93	78	15	0.9412	0.0588	2.773013802	1	0	0	2067	2607	0.068	0.071	0.92	0	0	0	0	0	17
163	93	76	17	0.9	0.1	2.197224577	1	0	0	2067	2607	0.068	0.071	1	0	0	0	0	0	10
164	93	74	19	0.6667	0.3333	0.693297184	1	0	0	2067	2607	0.068	0.071	1	0	0	0	0	0	24
165	77	72	5	0.7803	0.2197	1.267415482	0	0	1	1446	547	0.071	0.073	0	0	1	0	0	0	132
166	77	71	6	0.7833	0.2167	1.285001856	0	0	1	1446	547	0.071	0.073	0	0	0	1	0	0	89
167	77	70	7	0.7904	0.2096	1.327338194	0	0	1	1446	547	0.071	0.073	0	0	0	0	1	0	200
168	77	69	8	0.9257	0.0743	2.522439256	0	0	1	1446	547	0.071	0.073	0	0	0	0	0	1	224
169	77	68	9	0.9351	0.0649	2.667805852	0	0	1	1446	547	0.071	0.073	0	0	0	0	0	0	231
170	77	67	10	0.9652	0.0348	3.322717947	0	0	1	1446	547	0.071	0.073	0	0	0	0	0	0	201
171	77	66	11	0.9793	0.0207	3.85670433	0	0	1	1446	547	0.071	0.073	0	0	0	0	0	0	145
172	77	65	12	0.9583	0.0417	3.134659753	0	0	1	1446	547	0.071	0.073	0	0	0	0	0	0	144
173	77	64	13	0.9814	0.0186	3.965818543	0	0	1	1446	547	0.071	0.073	0	0	0	0	0	0	161
174	77	63	14	0.9779	0.0221	3.789829807	0	0	1	1446	547	0.071	0.073	0	0	0	0	0	0	136
175	77	62	15	0.9776	0.0224	3.77603963	0	0	1	1446	547	0.071	0.073	0	0	0	0	0	0	134
176	77	61	16	0.9701	0.0299	3.479540679	0	0	1	1446	547	0.071	0.073	0	0	0	0	0	0	134
177	77	60	17	0.9811	0.0189	3.949512469	0	0	1	1446	547	0.071	0.073	0	0	0	0	0	0	159
178	78	73	5	0.5904	0.4096	0.3656192	0	0	1	3550	1446	0.061	0.066	0	0	1	0	0	0	83
179	78	72	6	0.6383	0.3617	0.567993253	0	0	1	3550	1446	0.061	0.066	0	0	0	1	0	0	282
180	78	71	7	0.7204	0.2796	0.946446603	0	0	1	3550	1446	0.061	0.066	0	0	0	0	1	0	186
181	78	70	8	0.8075	0.1925	1.433846901	0	0	1	3550	1446	0.061	0.066	0	0	0	0	0	1	161
182	78	69	9	0.8868	0.1132	2.058463312	0	0	1	3550	1446	0.061	0.066	0	0	0	0	0	0	265
183	78	68	10	0.9436	0.0564	2.817233189	0	0	1	3550	1446	0.061	0.066	0	0	0	0	0	0	195
184	78	67	11	0.9492	0.0508	2.92772317	0	0	1	3550	1446	0.061	0.066	0	0	0	0	0	0	177
185	78	66	12	0.9714	0.0286	3.525331612	0	0	1	3550	1446	0.061	0.066	0	0	0	0	0	0	140
186	78	65	13	0.9577	0.0423	3.11974749	0	0	1	3550	1446	0.061	0.066	0	0	0	0	0	0	142
187	78	64	14	0.9803	0.0197	3.907240012	0	0	1	3550	1446	0.061	0.066	0	0	0	0	0	0	152
188	78	63	15	0.9704	0.0296	3.489933996	0	0	1	3550	1446	0.061	0.066	0	0	0	0	0	0	135
189	78	62	16	0.9767	0.0233	3.735726182	0	0	1	3550	1446	0.061	0.066	0	0	0	0	0	0	129
190	78	61	17	0.9766	0.0234	3.731341129	0	0	1	3550	1446	0.061	0.066	0	0	0	0	0	0	128
191	78	60	18	0.9351	0.0649	2.667805852	0	0	1	3550	1446	0.061	0.066	0	0	0	0	0	0	154
192	79	74	5	0.4952	0.5048	-0.01920059	0	0	1	3271	3550	0.058	0.056	0	0	1	0	0	0	105
193	79	73	6	0.5923	0.4077	0.373481653	0	0	1	3271	3550	0.058	0.056	0	0	0	1	0	0	233
194	79	72	7	0.6947	0.3053	0.822185198	0	0	1	3271	3550	0.058	0.056	0	0	0	0	1	0	190
195	79	71	8	0.7426	0.2574	1.059526247	0	0	1	3271	3550	0.058	0.056	0	0	0	0	0	1	136
196	79	70	9	0.8897	0.1103	2.087680401	0	0	1	3271	3550	0.058	0.056	0	0	0	0	0	0	136
197	79	69	10	0.8043	0.1957	1.41338946	0	0	1	3271	3550	0.058	0.056	0	0	0	0	0	0	230
198	79	68	11	0.9192	0.0808	2.431526761	0	0	1	3271	3550	0.058	0.056	0	0	0	0	0	0	198
199	79	67	12	0.9425	0.0575	2.796750972	0	0	1	3271	3550	0.058	0.056	0	0	0	0	0	0	174
200	79	66	13	0.9664	0.0336	3.35905176	0	0	1	3271	3550	0.058	0.056	0	0	0	0	0	0	149

#OBS	YR	YG	YOS	CR	1 - CR	LOGIT VALUE	HELO	JET	PROP	AHR	LAG	UNEMP	LAG	VSI/SSB	ACP	MSR	MSR+1	MSR+2	MSR+3	N
201	79	65	14	0.9586	0.0414	3.142193006	0	0	1	3271	3550	0.058	0.056	0	0	0	0	0	0	145
202	79	64	15	0.98	0.02	3.891820298	0	0	1	3271	3550	0.058	0.056	0	0	0	0	0	0	150
203	79	63	16	0.976	0.024	3.705408756	0	0	1	3271	3550	0.058	0.056	0	0	0	0	0	0	125
204	79	62	17	0.9746	0.0254	3.647277956	0	0	1	3271	3550	0.058	0.056	0	0	0	0	0	0	118
205	79	61	18	0.9587	0.0413	3.1447157	0	0	1	3271	3550	0.058	0.056	0	0	0	0	0	0	121
206	79	60	19	0.8855	0.1145	2.045577634	0	0	1	3271	3550	0.058	0.056	0	0	0	0	0	0	131
207	81	75	6	0.7181	0.2819	0.935056437	0	0	1	1116	750	0.076	0.069	0	0.71	1	0	0	0	227
208	81	74	7	0.7391	0.2609	1.041296038	0	0	1	1116	750	0.076	0.069	0	0.51	0	1	0	0	230
209	81	73	8	0.8939	0.1061	2.131211866	0	0	1	1116	750	0.076	0.069	0	0.57	0	0	1	0	132
210	81	72	9	0.877	0.123	1.964322637	0	0	1	1116	750	0.076	0.069	0	0.55	0	0	0	1	122
211	81	71	10	0.9158	0.0842	2.386603079	0	0	1	1116	750	0.076	0.069	0	0.57	0	0	0	0	95
212	81	70	11	0.9439	0.0561	2.822884416	0	0	1	1116	750	0.076	0.069	0	0.63	0	0	0	0	107
213	81	69	12	0.9548	0.0452	3.050404808	0	0	1	1116	750	0.076	0.069	0	0.62	0	0	0	0	177
214	81	68	13	0.9591	0.0409	3.154865282	0	0	1	1116	750	0.076	0.069	0	0.63	0	0	0	0	171
215	81	67	14	0.9813	0.0187	3.960354699	0	0	1	1116	750	0.076	0.069	0	0.65	0	0	0	0	160
216	81	66	15	0.9864	0.0136	4.283992159	0	0	1	1116	750	0.076	0.069	0	0.81	0	0	0	0	147
217	81	65	16	0.9538	0.0462	3.027474208	0	0	1	1116	750	0.076	0.069	0	0.5	0	0	0	0	130
218	81	64	17	0.9856	0.0144	4.226022386	0	0	1	1116	750	0.076	0.069	0	0.03	0	0	0	0	139
219	81	63	18	0.975	0.025	3.663561646	0	0	1	1116	750	0.076	0.069	0	0.01	0	0	0	0	120
220	81	62	19	0.8796	0.1204	1.988647726	0	0	1	1116	750	0.076	0.069	0	0.02	0	0	0	0	108
221	82	77	5	0.81	0.19	1.450010176	0	0	1	1050	1116	0.097	0.073	0	0.04	1	0	0	0	42
222	82	76	6	0.81	0.19	1.450010176	0	0	1	1050	1116	0.097	0.073	0	0.73	0	1	0	0	100
223	82	75	7	0.8085	0.1915	1.44029287	0	0	1	1050	1116	0.097	0.073	0	0.71	0	0	1	0	188
224	82	74	8	0.9144	0.0856	2.368582829	0	0	1	1050	1116	0.097	0.073	0	0.51	0	0	0	1	187
225	82	73	9	0.928	0.072	2.556365614	0	0	1	1050	1116	0.097	0.073	0	0.53	0	0	0	0	125
226	82	72	10	0.9083	0.0917	2.293052341	0	0	1	1050	1116	0.097	0.073	0	0.52	0	0	0	0	120
227	82	71	11	0.9239	0.0761	2.496555576	0	0	1	1050	1116	0.097	0.073	0	0.5	0	0	0	0	92
228	82	70	12	0.9643	0.0357	3.296251761	0	0	1	1050	1116	0.097	0.073	0	0.48	0	0	0	0	112
229	82	69	13	0.9451	0.0549	2.845777393	0	0	1	1050	1116	0.097	0.073	0	0.44	0	0	0	0	182
230	82	68	14	0.9821	0.0179	4.004892423	0	0	1	1050	1116	0.097	0.073	0	0.44	0	0	0	0	168
231	82	67	15	0.9765	0.0235	3.726974329	0	0	1	1050	1116	0.097	0.073	0	0.41	0	0	0	0	170
232	82	66	16	0.9722	0.0278	3.554525524	0	0	1	1050	1116	0.097	0.073	0	0.23	0	0	0	0	144
233	82	65	17	0.9603	0.0397	3.185894548	0	0	1	1050	1116	0.097	0.073	0	0.12	0	0	0	0	126
234	82	64	18	0.9635	0.0365	3.273260227	0	0	1	1050	1116	0.097	0.073	0	0	0	0	0	0	137
235	82	63	19	0.8929	0.1071	2.120711615	0	0	1	1050	1116	0.097	0.073	0	0.01	0	0	0	0	112
236	84	78	6	0.912	0.088	2.338303176	0	0	1	5465	2552	0.075	0.092	0	0.04	1	0	0	0	216
237	84	77	7	0.8288	0.1712	1.577146408	0	0	1	5465	2552	0.075	0.092	0	0.28	0	1	0	0	222
238	84	76	8	0.9213	0.0787	2.460142561	0	0	1	5465	2552	0.075	0.092	0	0.12	0	0	1	0	89
239	84	75	9	0.9568	0.0432	3.097753888	0	0	1	5465	2552	0.075	0.092	0	0.01	0	0	0	1	162
240	84	74	10	0.9474	0.0526	2.891005271	0	0	1	5465	2552	0.075	0.092	0	0.01	0	0	0	0	171

#OBS	YR	YG	YOS	CR	1 - CR	LOGIT VALUE	HELO	JET	PROP	AHR	LAG	UNEMP	LAG	VSI/SSB	ACP	MSR	MSR+1	MSR+2	MSR+3	N
241	84	73	11	0.938	0.062	2.716615564	0	0	1	5465	2552	0.075	0.092	0	0	0	0	0	0	129
242	84	72	12	0.9462	0.0538	2.867180496	0	0	1	5465	2552	0.075	0.092	0	0	0	0	0	0	130
243	84	71	13	0.9674	0.0326	3.390299772	0	0	1	5465	2552	0.075	0.092	0	0	0	0	0	0	92
244	84	70	14	0.9762	0.0238	3.713981903	0	0	1	5465	2552	0.075	0.092	0	0	0	0	0	0	126
245	84	69	15	0.9626	0.0374	3.247967252	0	0	1	5465	2552	0.075	0.092	0	0	0	0	0	0	187
246	84	68	16	0.9783	0.0217	3.808504111	0	0	1	5465	2552	0.075	0.092	0	0	0	0	0	0	184
247	84	67	17	0.9714	0.0286	3.525331612	0	0	1	5465	2552	0.075	0.092	0	0	0	0	0	0	175
248	84	66	18	0.9728	0.0272	3.576961538	0	0	1	5465	2552	0.075	0.092	0	0	0	0	0	0	147
249	84	65	19	0.872	0.128	1.91875916	0	0	1	5465	2552	0.075	0.092	0	0	0	0	0	0	125
250	85	79	6	0.799	0.201	1.380056038	0	0	1	7840	5465	0.072	0.071	0	0	1	0	0	0	194
251	85	78	7	0.6741	0.3259	0.726787882	0	0	1	7840	5465	0.072	0.071	0	0.03	0	1	0	0	224
252	85	77	8	0.8571	0.1429	1.791409513	0	0	1	7840	5465	0.072	0.071	0	0	0	0	1	0	161
253	85	76	9	0.925	0.075	2.512305624	0	0	1	7840	5465	0.072	0.071	0	0	0	0	0	1	80
254	85	75	10	0.9851	0.0149	4.191381946	0	0	1	7840	5465	0.072	0.071	0	0	0	0	0	0	134
255	85	74	11	0.9539	0.0461	3.029745894	0	0	1	7840	5465	0.072	0.071	0	0	0	0	0	0	152
256	85	73	12	0.9412	0.0588	2.773013802	0	0	1	7840	5465	0.072	0.071	0	0	0	0	0	0	119
257	85	72	13	0.9569	0.0431	3.100175896	0	0	1	7840	5465	0.072	0.071	0	0	0	0	0	0	116
258	85	71	14	0.9655	0.0345	3.331686778	0	0	1	7840	5465	0.072	0.071	0	0	0	0	0	0	87
259	85	70	15	0.9712	0.0288	3.518157033	0	0	1	7840	5465	0.072	0.071	0	0	0	0	0	0	104
260	85	69	16	0.9529	0.0471	3.007236965	0	0	1	7840	5465	0.072	0.071	0	0	0	0	0	0	170
261	85	68	17	0.98	0.02	3.891820298	0	0	1	7840	5465	0.072	0.071	0	0	0	0	0	0	150
262	85	67	18	0.971	0.029	3.511030638	0	0	1	7840	5465	0.072	0.071	0	0	0	0	0	0	138
263	85	66	19	0.9274	0.0726	2.54742005	0	0	1	7840	5465	0.072	0.071	0	0	0	0	0	0	124
264	86	80	6	0.7289	0.2711	0.989048792	0	0	1	6341	7840	0.07	0.068	0	0	1	0	0	0	166
265	86	79	7	0.6375	0.3625	0.564529803	0	0	1	6341	7840	0.07	0.068	0	0.02	0	1	0	0	160
266	86	78	8	0.8507	0.1493	1.740101835	0	0	1	6341	7840	0.07	0.068	0	0.01	0	0	1	0	134
267	86	77	9	0.9286	0.0714	2.565380206	0	0	1	6341	7840	0.07	0.068	0	0.01	0	0	0	1	126
268	86	76	10	0.9452	0.0548	2.847706351	0	0	1	6341	7840	0.07	0.068	0	0	0	0	0	0	73
269	86	75	11	0.9429	0.0571	2.804156116	0	0	1	6341	7840	0.07	0.068	0	0	0	0	0	0	140
270	86	74	12	0.95	0.05	2.944438979	0	0	1	6341	7840	0.07	0.068	0	0	0	0	0	0	160
271	86	73	13	0.9556	0.0444	3.069099946	0	0	1	6341	7840	0.07	0.068	0	0	0	0	0	0	135
272	86	72	14	0.9524	0.0476	2.996152353	0	0	1	6341	7840	0.07	0.068	0	0	0	0	0	0	126
273	86	71	15	0.967	0.033	3.377690934	0	0	1	6341	7840	0.07	0.068	0	0	0	0	0	0	91
274	86	70	16	0.9769	0.0231	3.744551675	0	0	1	6341	7840	0.07	0.068	0	0	0	0	0	0	130
275	86	69	17	0.956	0.044	3.078568279	0	0	1	6341	7840	0.07	0.068	0	0	0	0	0	0	182
276	86	68	18	0.9884	0.0116	4.445082376	0	0	1	6341	7840	0.07	0.068	0	0	0	0	0	0	172
277	86	67	19	0.9051	0.0949	2.255221729	0	0	1	6341	7840	0.07	0.068	0	0	0	0	0	0	158
278	87	81	6	0.5907	0.4093	0.366859891	0	0	1	7010	6341	0.062	0.066	0	0.03	1	0	0	0	215
279	87	80	7	0.7778	0.2222	1.252891545	0	0	1	7010	6341	0.062	0.066	0	0.1	0	1	0	0	108
280	87	79	8	0.8659	0.1341	1.865183638	0	0	1	7010	6341	0.062	0.066	0	0.08	0	0	1	0	82

#OBS	YR	YG	YOS	CR	1 - CR	LOGIT VALUE	HELO	JET	PROP	AHR	LAG	UNEMP	LAG	VSI/SSB	ACP	MSR	MSR+1	MSR+2	MSR+3	N
281	87	78	9	0.9744	0.0256	3.639229545	0	0	1	7010	6341	0.062	0.066	0	0.02	0	0	0	1	117
282	87	77	10	0.9737	0.0263	3.611534309	0	0	1	7010	6341	0.062	0.066	0	0.01	0	0	0	0	114
283	87	76	11	0.9365	0.0635	2.691109616	0	0	1	7010	6341	0.062	0.066	0	0.02	0	0	0	0	63
284	87	75	12	0.976	0.024	3.705408756	0	0	1	7010	6341	0.062	0.066	0	0	0	0	0	0	125
285	87	74	13	0.9351	0.0649	2.667805852	0	0	1	7010	6341	0.062	0.066	0	0	0	0	0	0	154
286	87	73	14	0.9389	0.0611	2.732197111	0	0	1	7010	6341	0.062	0.066	0	0	0	0	0	0	131
287	87	72	15	0.9609	0.0391	3.201747878	0	0	1	7010	6341	0.062	0.066	0	0	0	0	0	0	128
288	87	71	16	0.9787	0.0213	3.827518088	0	0	1	7010	6341	0.062	0.066	0	0	0	0	0	0	94
289	87	70	17	0.9783	0.0217	3.808504111	0	0	1	7010	6341	0.062	0.066	0	0	0	0	0	0	138
290	87	69	18	0.9392	0.0608	2.73743866	0	0	1	7010	6341	0.062	0.066	0	0	0	0	0	0	181
291	87	68	19	0.869	0.131	1.892145802	0	0	1	7010	6341	0.062	0.066	0	0	0	0	0	0	168
292	88	82	6	0.5867	0.4133	0.350339894	0	0	1	6683	7010	0.055	0.058	0	0.02	1	0	0	0	196
293	88	81	7	0.5561	0.4439	0.225348822	0	0	1	6683	7010	0.055	0.058	0	0.05	0	1	0	0	214
294	88	80	8	0.8276	0.1724	1.568712588	0	0	1	6683	7010	0.055	0.058	0	0.38	0	0	1	0	87
295	88	79	9	0.9103	0.0897	2.317303446	0	0	1	6683	7010	0.055	0.058	0	0.33	0	0	0	1	78
296	88	78	10	0.9412	0.0588	2.773013802	0	0	1	6683	7010	0.055	0.058	0	0.17	0	0	0	0	119
297	88	77	11	0.8947	0.1053	2.139675047	0	0	1	6683	7010	0.055	0.058	0	0	0	0	0	0	114
298	88	76	12	0.9508	0.0492	2.961410112	0	0	1	6683	7010	0.055	0.058	0	0	0	0	0	0	61
299	88	75	13	0.9624	0.0376	3.242426114	0	0	1	6683	7010	0.055	0.058	0	0	0	0	0	0	133
300	88	74	14	0.9017	0.0983	2.216257843	0	0	1	6683	7010	0.055	0.058	0	0	0	0	0	0	173
301	88	73	15	0.9343	0.0657	2.65469866	0	0	1	6683	7010	0.055	0.058	0	0	0	0	0	0	137
302	88	72	16	0.966	0.034	3.34680331	0	0	1	6683	7010	0.055	0.058	0	0	0	0	0	0	147
303	88	71	17	0.9623	0.0377	3.239666158	0	0	1	6683	7010	0.055	0.058	0	0	0	0	0	0	106
304	88	70	18	0.9573	0.0427	3.109917902	0	0	1	6683	7010	0.055	0.058	0	0	0	0	0	0	164
305	88	69	19	0.7921	0.2079	1.337630452	0	0	1	6683	7010	0.055	0.058	0	0	0	0	0	0	202
306	89	83	6	0.648	0.352	0.610259521	0	0	1	9026	6683	0.053	0.052	0	0.01	1	0	0	0	125
307	89	82	7	0.6692	0.3308	0.704569006	0	0	1	9026	6683	0.053	0.052	0	0	0	1	0	0	266
308	89	81	8	0.7261	0.2739	0.97492467	0	0	1	9026	6683	0.053	0.052	0	0.01	0	0	1	0	157
309	89	80	9	0.8969	0.1031	2.163244982	0	0	1	9026	6683	0.053	0.052	0	0	0	0	0	1	97
310	89	79	10	0.9518	0.0482	2.982995908	0	0	1	9026	6683	0.053	0.052	0	0	0	0	0	0	83
311	89	78	11	0.9704	0.0296	3.489933996	0	0	1	9026	6683	0.053	0.052	0	0	0	0	0	0	135
312	89	77	12	0.9244	0.0756	2.503688595	0	0	1	9026	6683	0.053	0.052	0	0	0	0	0	0	119
313	89	76	13	0.9524	0.0476	2.996152353	0	0	1	9026	6683	0.053	0.052	0	0	0	0	0	0	63
314	89	75	14	0.9437	0.0563	2.819113784	0	0	1	9026	6683	0.053	0.052	0	0	0	0	0	0	142
315	89	74	15	0.9231	0.0769	2.485231694	0	0	1	9026	6683	0.053	0.052	0	0	0	0	0	0	182
316	89	73	16	0.9514	0.0486	2.974311053	0	0	1	9026	6683	0.053	0.052	0	0	0	0	0	0	144
317	89	72	17	0.9805	0.0195	3.91764818	0	0	1	9026	6683	0.053	0.052	0	0	0	0	0	0	154
318	89	71	18	0.9327	0.0673	2.628923369	0	0	1	9026	6683	0.053	0.052	0	0	0	0	0	0	104
319	89	70	19	0.7425	0.2575	1.059003151	0	0	1	9026	6683	0.053	0.052	0	0	0	0	0	0	167
320	90	84	6	0.7338	0.2662	1.013988606	0	0	1	4779	9026	0.055	0.05	0	0.3	1	0	0	0	139

#OBS	YR	YG	YOS	CR	1 - CR	LOGIT VALUE	HELO	JET	PROP	AHR	LAG	UNEMP	LAG	VSI/SSB	ACP	MSR	MSR+1	MSR+2	MSR+3	N
321	90	83	7	0.6609	0.3391	0.667307493	0	0	1	4779	9026	0.055	0.05	0	0.24	0	1	0	0	230
322	90	82	8	0.699	0.301	0.842540477	0	0	1	4779	9026	0.055	0.05	0	0.09	0	0	1	0	196
323	90	81	9	0.9024	0.0976	2.224180387	0	0	1	4779	9026	0.055	0.05	0	0.02	0	0	0	1	123
324	90	80	10	0.978	0.022	3.794467217	0	0	1	4779	9026	0.055	0.05	0	0.04	0	0	0	0	91
325	90	79	11	0.9762	0.0238	3.713981903	0	0	1	4779	9026	0.055	0.05	0	0.01	0	0	0	0	84
326	90	78	12	0.9407	0.0593	2.764014973	0	0	1	4779	9026	0.055	0.05	0	0	0	0	0	0	135
327	90	77	13	0.9748	0.0252	3.655388327	0	0	1	4779	9026	0.055	0.05	0	0	0	0	0	0	119
328	90	75	15	0.9549	0.0451	3.052724376	0	0	1	4779	9026	0.055	0.05	0	0	0	0	0	0	133
329	90	74	16	0.9653	0.0347	3.325699247	0	0	1	4779	9026	0.055	0.05	0	0	0	0	0	0	173
330	90	73	17	0.9375	0.0625	2.708050201	0	0	1	4779	9026	0.055	0.05	0	0	0	0	0	0	144
331	90	72	18	0.966	0.034	3.34680331	0	0	1	4779	9026	0.055	0.05	0	0	0	0	0	0	147
332	90	71	19	0.7981	0.2019	1.374461378	0	0	1	4779	9026	0.055	0.05	0	0	0	0	0	0	104
333	91	85	6	0.7049	0.2951	0.870741667	0	0	1	4004	4779	0.067	0.053	0	0.32	1	0	0	0	244
334	91	84	7	0.6289	0.3711	0.527500693	0	0	1	4004	4779	0.067	0.053	0	0.19	0	1	0	0	194
335	91	83	8	0.6546	0.3454	0.639321196	0	0	1	4004	4779	0.067	0.053	0	0.06	0	0	1	0	194
336	91	82	9	0.8671	0.1329	1.875557345	0	0	1	4004	4779	0.067	0.053	0	0.05	0	0	0	1	173
337	91	81	10	0.9118	0.0882	2.335813705	0	0	1	4004	4779	0.067	0.053	0	0.01	0	0	0	0	136
338	91	80	11	0.9211	0.0789	2.45738738	0	0	1	4004	4779	0.067	0.053	0	0	0	0	0	0	114
339	91	79	12	0.8917	0.1083	2.108224599	0	0	1	4004	4779	0.067	0.053	0	0	0	0	0	0	120
340	91	78	13	0.929	0.071	2.571428862	0	0	1	4004	4779	0.067	0.053	0	0	0	0	0	0	155
341	91	77	14	0.9477	0.0523	2.897041625	0	0	1	4004	4779	0.067	0.053	0	0	0	0	0	0	153
342	91	76	15	0.9744	0.0256	3.639229545	0	0	1	4004	4779	0.067	0.053	0	0	0	0	0	0	78
343	91	75	16	0.9483	0.0517	2.909213126	0	0	1	4004	4779	0.067	0.053	0	0	0	0	0	0	174
344	91	74	17	0.9515	0.0485	2.976475889	0	0	1	4004	4779	0.067	0.053	0	0	0	0	0	0	206
345	91	73	18	0.9191	0.0809	2.430181106	0	0	1	4004	4779	0.067	0.053	0	0	0	0	0	0	173
346	91	72	19	0.8512	0.1488	1.744043996	0	0	1	4004	4779	0.067	0.053	0	0	0	0	0	0	168
347	92	86	6	0.8439	0.1561	1.687537177	0	0	1	2607	4004	0.074	0.065	0	0.47	1	0	0	0	205
348	92	85	7	0.786	0.214	1.300980777	0	0	1	2607	4004	0.074	0.065	0	0.19	0	1	0	0	299
349	92	84	8	0.7034	0.2966	0.86354129	0	0	1	2607	4004	0.074	0.065	0	0.05	0	0	1	0	145
350	92	83	9	0.75	0.25	1.098612289	0	0	1	2607	4004	0.074	0.065	0	0.01	0	0	0	1	148
351	92	82	10	0.9408	0.0592	2.765809035	0	0	1	2607	4004	0.074	0.065	0	0.01	0	0	0	0	152
352	92	81	11	0.963	0.037	3.259135499	0	0	1	2607	4004	0.074	0.065	0	0	0	0	0	0	135
353	92	80	12	0.9727	0.0273	3.573189008	0	0	1	2607	4004	0.074	0.065	0	0	0	0	0	0	110
354	92	79	13	0.9658	0.0342	3.340731129	0	0	1	2607	4004	0.074	0.065	0	0	0	0	0	0	117
355	92	78	14	0.9688	0.0312	3.435640097	0	0	1	2607	4004	0.074	0.065	0	0	0	0	0	0	160
356	92	77	15	0.9686	0.0314	3.429043837	0	0	1	2607	4004	0.074	0.065	0	0	0	0	0	0	159
357	92	75	17	0.963	0.037	3.259135499	0	0	1	2607	4004	0.074	0.065	0	0	0	0	0	0	189
358	92	74	18	0.9689	0.0311	3.438953588	0	0	1	2607	4004	0.074	0.065	0	0	0	0	0	0	225
359	92	73	19	0.8351	0.1649	1.622212249	0	0	1	2607	4004	0.074	0.065	0	0	0	0	0	0	188
360	93	86	7	0.7613	0.2387	1.159819965	0	0	1	2067	2607	0.068	0.071	0.46	0.04	1	0	0	0	331

#OBS	YR	YG	YOS	CR	1 - CR	LOGIT VALUE	HELO	JET	PROP	AHR	LAG	UNEMP	LAG	VSI/SSB	ACP	MSR	MSR+1	MSR+2	MSR+3	N
361	93	85	8	0.5959	0.4041	0.388410496	0	0	1	2067	2607	0.068	0.071	0.2	0.03	0	1	0	0	245
362	93	84	9	0.8571	0.1429	1.791409513	0	0	1	2067	2607	0.068	0.071	0.23	0.01	0	0	1	0	105
363	93	83	10	0.876	0.124	1.955084525	0	0	1	2067	2607	0.068	0.071	0.15	0.01	0	0	0	1	121
364	93	82	11	0.9275	0.0725	2.548906233	0	0	1	2067	2607	0.068	0.071	0.16	0.01	0	0	0	0	138
365	93	81	12	0.9333	0.0667	2.63852174	0	0	1	2067	2607	0.068	0.071	0.34	0	0	0	0	0	135
366	93	80	13	0.9224	0.0776	2.475411542	0	0	1	2067	2607	0.068	0.071	0.69	0	0	0	0	0	116
367	93	79	14	0.985	0.015	4.18459144	0	0	1	2067	2607	0.068	0.071	0.99	0	0	0	0	0	133
368	93	78	15	0.9706	0.0294	3.496919763	0	0	1	2067	2607	0.068	0.071	0.98	0	0	0	0	0	170
369	93	77	16	0.95	0.05	2.944438979	0	0	1	2067	2607	0.068	0.071	0.98	0	0	0	0	0	160
370	93	76	17	0.9565	0.0435	3.090519851	0	0	1	2067	2607	0.068	0.071	0.99	0	0	0	0	0	92
371	93	75	18	0.9355	0.0645	2.674415922	0	0	1	2067	2607	0.068	0.071	0.98	0	0	0	0	0	186
372	93	74	19	0.8444	0.1556	1.691337704	0	0	1	2067	2607	0.068	0.071	0.99	0	0	0	0	0	225
373	77	70	7	0.785	0.215	1.29504569	0	1	0	1446	547	0.071	0.073	0	0	1	0	0	0	200
374	77	69	8	0.9241	0.0759	2.499403606	0	1	0	1446	547	0.071	0.073	0	0	0	1	0	0	224
375	77	68	9	0.9375	0.0625	2.708050201	0	1	0	1446	547	0.071	0.073	0	0	0	0	1	0	192
376	77	67	10	0.9714	0.0286	3.525331612	0	1	0	1446	547	0.071	0.073	0	0	0	0	0	1	175
377	77	66	11	0.9877	0.0123	4.385779746	0	1	0	1446	547	0.071	0.073	0	0	0	0	0	0	163
378	77	65	12	0.9677	0.0323	3.399854892	0	1	0	1446	547	0.071	0.073	0	0	0	0	0	0	93
379	77	64	13	0.9231	0.0769	2.485231694	0	1	0	1446	547	0.071	0.073	0	0	0	0	0	0	65
380	77	63	14	0.9535	0.0465	3.020687112	0	1	0	1446	547	0.071	0.073	0	0	0	0	0	0	43
381	78	71	7	0.5979	0.4021	0.396722702	0	1	0	3550	1446	0.061	0.066	0	0	1	0	0	0	97
382	78	70	8	0.7329	0.2671	1.009386147	0	1	0	3550	1446	0.061	0.066	0	0	0	1	0	0	146
383	78	69	9	0.8534	0.1466	1.761520581	0	1	0	3550	1446	0.061	0.066	0	0	0	0	1	0	191
384	78	68	10	0.879	0.121	1.982994352	0	1	0	3550	1446	0.061	0.066	0	0	0	0	0	1	157
385	78	67	11	0.9359	0.0641	2.681064269	0	1	0	3550	1446	0.061	0.066	0	0	0	0	0	0	156
386	78	66	12	0.9869	0.0131	4.321956487	0	1	0	3550	1446	0.061	0.066	0	0	0	0	0	0	153
387	78	65	13	0.9524	0.0476	2.996152353	0	1	0	3550	1446	0.061	0.066	0	0	0	0	0	0	84
388	78	64	14	0.9355	0.0645	2.674415922	0	1	0	3550	1446	0.061	0.066	0	0	0	0	0	0	62
389	78	63	15	0.9722	0.0278	3.554525524	0	1	0	3550	1446	0.061	0.066	0	0	0	0	0	0	36
390	78	62	16	0.9773	0.0227	3.762428743	0	1	0	3550	1446	0.061	0.066	0	0	0	0	0	0	44
391	78	60	18	0.9286	0.0714	2.565380206	0	1	0	3550	1446	0.061	0.066	0	0	0	0	0	0	42
392	79	72	7	0.6939	0.3061	0.818416012	0	1	0	3271	3550	0.058	0.056	0	0	1	0	0	0	98
393	79	71	8	0.7	0.3	0.84729786	0	1	0	3271	3550	0.058	0.056	0	0	0	1	0	0	60
394	79	70	9	0.8247	0.1753	1.548520892	0	1	0	3271	3550	0.058	0.056	0	0	0	0	1	0	97
395	79	69	10	0.8288	0.1712	1.577146408	0	1	0	3271	3550	0.058	0.056	0	0	0	0	0	1	146
396	79	68	11	0.9231	0.0769	2.485231694	0	1	0	3271	3550	0.058	0.056	0	0	0	0	0	0	117
397	79	67	12	0.9197	0.0803	2.438277909	0	1	0	3271	3550	0.058	0.056	0	0	0	0	0	0	137
398	79	66	13	0.9932	0.0068	4.984009441	0	1	0	3271	3550	0.058	0.056	0	0	0	0	0	0	148
399	79	65	14	0.974	0.026	3.623314766	0	1	0	3271	3550	0.058	0.056	0	0	0	0	0	0	77
400	79	64	15	0.95	0.05	2.944438979	0	1	0	3271	3550	0.058	0.056	0	0	0	0	0	0	60

#OBS	YR	YG	YOS	CR	1 - CR	LOGIT VALUE	HELO	JET	PROP	AHR	LAG	UNEMP	LAG	VSI/SSB	ACP	MSR	MSR+1	MSR+2	MSR+3	N
401	79	63	16	0.975	0.025	3.663561646	0	1	0	3271	3550	0.058	0.056	0	0	0	0	0	0	40
402	79	62	17	0.9778	0.0222	3.785212861	0	1	0	3271	3550	0.058	0.056	0	0	0	0	0	0	45
403	79	60	19	0.9318	0.0682	2.614673635	0	1	0	3271	3550	0.058	0.056	0	0	0	0	0	0	44
404	81	74	7	0.7745	0.2255	1.233897501	0	1	0	1116	750	0.076	0.069	0	0.25	1	0	0	0	102
405	81	73	8	0.8235	0.1765	1.540242673	0	1	0	1116	750	0.076	0.069	0	0.49	0	1	0	0	85
406	81	72	9	0.9167	0.0833	2.398331716	0	1	0	1116	750	0.076	0.069	0	0.45	0	0	1	0	72
407	81	71	10	0.875	0.125	1.945910149	0	1	0	1116	750	0.076	0.069	0	0.49	0	0	0	1	40
408	81	70	11	0.96	0.04	3.17805383	0	1	0	1116	750	0.076	0.069	0	0.56	0	0	0	0	75
409	81	69	12	0.9909	0.0091	4.690339208	0	1	0	1116	750	0.076	0.069	0	0.62	0	0	0	0	110
410	81	68	13	0.9694	0.0306	3.455677314	0	1	0	1116	750	0.076	0.069	0	0.58	0	0	0	0	98
411	81	67	14	0.9732	0.0268	3.592187723	0	1	0	1116	750	0.076	0.069	0	0.66	0	0	0	0	112
412	81	66	15	0.9917	0.0083	4.783165127	0	1	0	1116	750	0.076	0.069	0	0.59	0	0	0	0	121
413	81	65	16	0.9552	0.0448	3.059712603	0	1	0	1116	750	0.076	0.069	0	0.78	0	0	0	0	67
414	81	64	17	0.9464	0.0536	2.871116245	0	1	0	1116	750	0.076	0.069	0	0.43	0	0	0	0	56
415	81	63	18	0.9706	0.0294	3.496919763	0	1	0	1116	750	0.076	0.069	0	0	0	0	0	0	34
416	81	62	19	0.875	0.125	1.945910149	0	1	0	1116	750	0.076	0.069	0	0.08	0	0	0	0	40
417	82	75	7	0.7938	0.2062	1.347984969	0	1	0	1050	1116	0.097	0.073	0	0.78	1	0	0	0	160
418	82	74	8	0.8929	0.1071	2.120711615	0	1	0	1050	1116	0.097	0.073	0	0.58	0	1	0	0	84
419	82	73	9	0.9286	0.0714	2.565380206	0	1	0	1050	1116	0.097	0.073	0	0.57	0	0	1	0	84
420	82	72	10	0.9552	0.0448	3.059712603	0	1	0	1050	1116	0.097	0.073	0	0.63	0	0	0	1	67
421	82	71	11	0.9459	0.0541	2.861302669	0	1	0	1050	1116	0.097	0.073	0	0.47	0	0	0	0	37
422	82	70	12	0.9452	0.0548	2.847706351	0	1	0	1050	1116	0.097	0.073	0	0.54	0	0	0	0	73
423	82	69	13	0.9909	0.0091	4.690339208	0	1	0	1050	1116	0.097	0.073	0	0.39	0	0	0	0	110
424	82	68	14	0.9794	0.0206	3.861649063	0	1	0	1050	1116	0.097	0.073	0	0.45	0	0	0	0	97
425	82	67	15	0.9802	0.0198	3.902074695	0	1	0	1050	1116	0.097	0.073	0	0.26	0	0	0	0	101
426	82	66	16	0.9911	0.0089	4.712764161	0	1	0	1050	1116	0.097	0.073	0	0.16	0	0	0	0	112
427	82	65	17	0.9649	0.0351	3.313823339	0	1	0	1050	1116	0.097	0.073	0	0	0	0	0	0	57
428	82	64	18	0.9245	0.0755	2.505120395	0	1	0	1050	1116	0.097	0.073	0	0	0	0	0	0	53
429	82	63	19	0.8529	0.1471	1.75752968	0	1	0	1050	1116	0.097	0.073	0	0	0	0	0	0	34
430	84	77	7	0.9375	0.0625	2.708050201	0	1	0	5465	2552	0.075	0.092	0	0.33	1	0	0	0	176
431	84	76	8	0.8861	0.1139	2.051508941	0	1	0	5465	2552	0.075	0.092	0	0.14	0	1	0	0	79
432	84	75	9	0.9304	0.0696	2.592850034	0	1	0	5465	2552	0.075	0.092	0	0.02	0	0	1	0	115
433	84	74	10	0.9867	0.0133	4.306602007	0	1	0	5465	2552	0.075	0.092	0	0.03	0	0	0	1	75
434	84	73	11	0.9419	0.0581	2.785733448	0	1	0	5465	2552	0.075	0.092	0	0.02	0	0	0	0	86
435	84	72	12	0.9831	0.0169	4.063397222	0	1	0	5465	2552	0.075	0.092	0	0	0	0	0	0	59
436	84	71	13	0.9375	0.0625	2.708050201	0	1	0	5465	2552	0.075	0.092	0	0	0	0	0	0	32
437	84	70	14	0.9545	0.0455	3.043475317	0	1	0	5465	2552	0.075	0.092	0	0	0	0	0	0	66
438	84	69	15	0.99	0.01	4.59511985	0	1	0	5465	2552	0.075	0.092	0	0	0	0	0	0	100
439	84	68	16	0.9885	0.0115	4.453841607	0	1	0	5465	2552	0.075	0.092	0	0	0	0	0	0	87
440	84	66	18	0.9667	0.0333	3.368330812	0	1	0	5465	2552	0.075	0.092	0	0	0	0	0	0	90

#OBS	YR	YG	YOS	CR	1 - CR	LOGIT VALUE	HELO	JET	PROP	AHR	LAG	UNEMP	LAG	VSI/SSB	ACP	MSR	MSR+1	MSR+2	MSR+3	N
441	84	65	19	0.8571	0.1429	1.791409513	0	1	0	5465	2552	0.075	0.092	0	0	0	0	0	0	49
442	85	78	7	0.7425	0.2575	1.059003151	0	1	0	7840	5465	0.072	0.071	0	0.14	1	0	0	0	233
443	85	77	8	0.8912	0.1088	2.103057535	0	1	0	7840	5465	0.072	0.071	0	0.01	0	1	0	0	147
444	85	76	9	0.9524	0.0476	2.996152353	0	1	0	7840	5465	0.072	0.071	0	0.02	0	0	1	0	63
445	85	75	10	0.9697	0.0303	3.465839033	0	1	0	7840	5465	0.072	0.071	0	0	0	0	0	1	99
446	85	74	11	0.971	0.029	3.511030638	0	1	0	7840	5465	0.072	0.071	0	0	0	0	0	0	69
447	85	73	12	0.9268	0.0732	2.538542372	0	1	0	7840	5465	0.072	0.071	0	0	0	0	0	0	82
448	85	72	13	0.9677	0.0323	3.399854892	0	1	0	7840	5465	0.072	0.071	0	0	0	0	0	0	62
449	85	71	14	0.9412	0.0588	2.773013802	0	1	0	7840	5465	0.072	0.071	0	0	0	0	0	0	34
450	85	70	15	0.9859	0.0141	4.247380132	0	1	0	7840	5465	0.072	0.071	0	0	0	0	0	0	71
451	85	69	16	0.9905	0.0095	4.646918068	0	1	0	7840	5465	0.072	0.071	0	0	0	0	0	0	105
452	85	68	17	0.9904	0.0096	4.636345803	0	1	0	7840	5465	0.072	0.071	0	0	0	0	0	0	104
453	85	67	18	0.9528	0.0472	3.005011125	0	1	0	7840	5465	0.072	0.071	0	0	0	0	0	0	106
454	85	66	19	0.875	0.125	1.945910149	0	1	0	7840	5465	0.072	0.071	0	0	0	0	0	0	104
455	86	78	8	0.8472	0.1528	1.712806918	0	1	0	6341	7840	0.07	0.068	0	0.07	1	0	0	0	144
456	86	77	9	0.932	0.068	2.61782511	0	1	0	6341	7840	0.07	0.068	0	0.03	0	1	0	0	103
457	86	76	10	0.9592	0.0408	3.157417522	0	1	0	6341	7840	0.07	0.068	0	0	0	0	1	0	49
458	86	75	11	0.9125	0.0875	2.344549292	0	1	0	6341	7840	0.07	0.068	0	0	0	0	0	1	80
459	86	74	12	0.9821	0.0179	4.004892423	0	1	0	6341	7840	0.07	0.068	0	0	0	0	0	0	56
460	86	73	13	0.8933	0.1067	2.124901312	0	1	0	6341	7840	0.07	0.068	0	0	0	0	0	0	75
461	86	72	14	0.9464	0.0536	2.871116245	0	1	0	6341	7840	0.07	0.068	0	0	0	0	0	0	56
462	86	71	15	0.931	0.069	2.602152773	0	1	0	6341	7840	0.07	0.068	0	0	0	0	0	0	29
463	86	70	16	0.9667	0.0333	3.368330812	0	1	0	6341	7840	0.07	0.068	0	0	0	0	0	0	60
464	86	69	17	0.9895	0.0105	4.545824508	0	1	0	6341	7840	0.07	0.068	0	0	0	0	0	0	95
465	86	68	18	0.9875	0.0125	4.369447852	0	1	0	6341	7840	0.07	0.068	0	0	0	0	0	0	80
466	86	67	19	0.9467	0.0533	2.877045922	0	1	0	6341	7840	0.07	0.068	0	0	0	0	0	0	75
467	87	79	8	0.8477	0.1523	1.71667454	0	1	0	7010	6341	0.062	0.066	0	0.24	1	0	0	0	151
468	87	78	9	0.9238	0.0762	2.495134135	0	1	0	7010	6341	0.062	0.066	0	0.05	0	1	0	0	105
469	87	77	10	0.9744	0.0256	3.639229545	0	1	0	7010	6341	0.062	0.066	0	0.01	0	0	1	0	78
470	87	76	11	0.9756	0.0244	3.688469534	0	1	0	7010	6341	0.062	0.066	0	0.02	0	0	0	1	41
471	87	75	12	0.9559	0.0441	3.076193523	0	1	0	7010	6341	0.062	0.066	0	0	0	0	0	0	68
472	87	73	14	0.8986	0.1014	2.181764905	0	1	0	7010	6341	0.062	0.066	0	0	0	0	0	0	69
473	87	71	16	0.9615	0.0385	3.217836324	0	1	0	7010	6341	0.062	0.066	0	0	0	0	0	0	26
474	87	70	17	0.963	0.037	3.259135499	0	1	0	7010	6341	0.062	0.066	0	0	0	0	0	0	54
475	87	69	18	0.9762	0.0238	3.713981903	0	1	0	7010	6341	0.062	0.066	0	0	0	0	0	0	84
476	87	68	19	0.76	0.24	1.15267951	0	1	0	7010	6341	0.062	0.066	0	0	0	0	0	0	75
477	88	80	8	0.6667	0.3333	0.693297184	0	1	0	6683	7010	0.055	0.058	0	0.09	1	0	0	0	105
478	88	79	9	0.848	0.152	1.719000115	0	1	0	6683	7010	0.055	0.058	0	0.05	0	1	0	0	125
479	88	78	10	0.967	0.033	3.377690934	0	1	0	6683	7010	0.055	0.058	0	0.01	0	0	1	0	91
480	88	77	11	0.863	0.137	1.840433765	0	1	0	6683	7010	0.055	0.058	0	0.01	0	0	0	1	73

#OBS	YR	YG	YOS	CR	1 - CR	LOGIT VALUE	HELO	JET	PROP	AHR	LAG	UNEMP	LAG	VSI/SSB	ACP	MSR	MSR+1	MSR+2	MSR+3	N
481	88	76	12	0.881	0.119	2.001934133	0	1	0	6683	7010	0.055	0.058	0	0	0	0	0	0	42
482	88	75	13	0.9545	0.0455	3.043475317	0	1	0	6683	7010	0.055	0.058	0	0	0	0	0	0	66
483	88	73	15	0.9254	0.0746	2.518085569	0	1	0	6683	7010	0.055	0.058	0	0	0	0	0	0	67
484	88	71	17	0.9615	0.0385	3.217836324	0	1	0	6683	7010	0.055	0.058	0	0	0	0	0	0	26
485	88	70	18	0.9811	0.0189	3.949512469	0	1	0	6683	7010	0.055	0.058	0	0	0	0	0	0	53
486	88	69	19	0.7901	0.2099	1.325528293	0	1	0	6683	7010	0.055	0.058	0	0	0	0	0	0	81
487	89	81	8	0.6954	0.3046	0.825487779	0	1	0	9026	6683	0.053	0.052	0	0	1	0	0	0	151
488	89	80	9	0.8361	0.1639	1.629491737	0	1	0	9026	6683	0.053	0.052	0	0	0	1	0	0	61
489	89	79	10	0.931	0.069	2.602152773	0	1	0	9026	6683	0.053	0.052	0	0	0	0	1	0	87
490	89	78	11	0.9737	0.0263	3.611534309	0	1	0	9026	6683	0.053	0.052	0	0	0	0	0	1	76
491	89	77	12	0.9016	0.0984	2.215130159	0	1	0	9026	6683	0.053	0.052	0	0	0	0	0	0	61
492	89	76	13	0.8158	0.1842	1.488147103	0	1	0	9026	6683	0.053	0.052	0	0	0	0	0	0	38
493	89	75	14	0.9821	0.0179	4.004892423	0	1	0	9026	6683	0.053	0.052	0	0	0	0	0	0	56
494	89	74	15	0.9615	0.0385	3.217836324	0	1	0	9026	6683	0.053	0.052	0	0	0	0	0	0	52
495	89	73	16	0.9206	0.0794	2.450527263	0	1	0	9026	6683	0.053	0.052	0	0	0	0	0	0	63
496	89	71	18	0.9655	0.0345	3.331686778	0	1	0	9026	6683	0.053	0.052	0	0	0	0	0	0	29
497	89	70	19	0.8393	0.1607	1.653028938	0	1	0	9026	6683	0.053	0.052	0	0	0	0	0	0	56
498	90	82	8	0.7	0.3	0.84729786	0	1	0	4779	9026	0.055	0.05	0	0.09	1	0	0	0	190
499	90	81	9	0.8585	0.1415	1.802886963	0	1	0	4779	9026	0.055	0.05	0	0.02	0	1	0	0	106
500	90	80	10	0.8627	0.1373	1.837898693	0	1	0	4779	9026	0.055	0.05	0	0.01	0	0	1	0	51
501	90	79	11	0.962	0.038	3.231428291	0	1	0	4779	9026	0.055	0.05	0	0.01	0	0	0	1	79
502	90	78	12	0.8056	0.1944	1.421669449	0	1	0	4779	9026	0.055	0.05	0	0	0	0	0	0	72
503	90	77	13	0.8214	0.1786	1.525861533	0	1	0	4779	9026	0.055	0.05	0	0	0	0	0	0	56
504	90	76	14	0.9091	0.0909	2.302695098	0	1	0	4779	9026	0.055	0.05	0	0	0	0	0	0	33
505	90	75	15	0.9464	0.0536	2.871116245	0	1	0	4779	9026	0.055	0.05	0	0	0	0	0	0	56
506	90	73	17	0.918	0.082	2.415478143	0	1	0	4779	9026	0.055	0.05	0	0	0	0	0	0	61
507	90	71	19	0.8966	0.1034	2.16000487	0	1	0	4779	9026	0.055	0.05	0	0	0	0	0	0	29
508	91	83	8	0.6159	0.3841	0.472181677	0	1	0	4004	4779	0.067	0.053	0	0.08	1	0	0	0	138
509	91	82	9	0.7328	0.2672	1.008875372	0	1	0	4004	4779	0.067	0.053	0	0.03	0	1	0	0	131
510	91	81	10	0.875	0.125	1.945910149	0	1	0	4004	4779	0.067	0.053	0	0.04	0	0	1	0	80
511	91	80	11	0.8974	0.1026	2.168663761	0	1	0	4004	4779	0.067	0.053	0	0	0	0	0	1	39
512	91	79	12	0.8765	0.1235	1.959695548	0	1	0	4004	4779	0.067	0.053	0	0	0	0	0	0	81
513	91	78	13	0.7903	0.2097	1.326734682	0	1	0	4004	4779	0.067	0.053	0	0	0	0	0	0	62
514	91	77	14	0.875	0.125	1.945910149	0	1	0	4004	4779	0.067	0.053	0	0	0	0	0	0	48
515	91	76	15	0.8125	0.1875	1.466337069	0	1	0	4004	4779	0.067	0.053	0	0	0	0	0	0	32
516	91	75	16	0.9348	0.0652	2.662873134	0	1	0	4004	4779	0.067	0.053	0	0	0	0	0	0	46
517	91	74	17	0.9455	0.0545	2.853513186	0	1	0	4004	4779	0.067	0.053	0	0	0	0	0	0	55
518	91	73	18	0.871	0.129	1.909829572	0	1	0	4004	4779	0.067	0.053	0	0	0	0	0	0	62
519	91	72	19	0.8511	0.1489	1.743254691	0	1	0	4004	4779	0.067	0.053	0	0	0	0	0	0	47
520	92	84	8	0.7798	0.2202	1.264501252	0	1	0	2607	4004	0.074	0.065	0	0.09	1	0	0	0	109

#OBS	YR	YG	YOS	CR	1 - CR	LOGIT VALUE	HELO	JET	PROP	AHR	LAG	UNEMP	LAG	VSI/SSB	ACP	MSR	MSR+1	MSR+2	MSR+3	N
521	92	83	9	0.6452	0.3548	0.598006096	0	1	0	2607	4004	0.074	0.065	0	0.03	0	1	0	0	93
522	92	82	10	0.83	0.17	1.585627264	0	1	0	2607	4004	0.074	0.065	0	0	0	0	1	0	100
523	92	81	11	0.9344	0.0656	2.656328916	0	1	0	2607	4004	0.074	0.065	0	0	0	0	0	1	61
524	92	80	12	0.875	0.125	1.945910149	0	1	0	2607	4004	0.074	0.065	0	0	0	0	0	0	32
525	92	79	13	0.9524	0.0476	2.996152353	0	1	0	2607	4004	0.074	0.065	0	0	0	0	0	0	63
526	92	78	14	0.9714	0.0286	3.525331612	0	1	0	2607	4004	0.074	0.065	0	0	0	0	0	0	35
527	92	76	16	0.9167	0.0833	2.398331716	0	1	0	2607	4004	0.074	0.065	0	0	0	0	0	0	12
528	92	75	17	0.95	0.05	2.944438979	0	1	0	2607	4004	0.074	0.065	0	0	0	0	0	0	20
529	92	73	19	0.8182	0.1818	1.504199624	0	1	0	2607	4004	0.074	0.065	0	0	0	0	0	0	33
530	93	85	8	0.7912	0.2088	1.332173924	0	1	0	2067	2607	0.068	0.071	0.15	0.08	1	0	0	0	273
531	93	84	9	0.7582	0.2418	1.142836265	0	1	0	2067	2607	0.061	0.071	0.19	0.02	0	1	0	0	91
532	93	83	10	0.8254	0.1746	1.553370474	0	1	0	2067	2607	0.061	0.071	0.13	0.02	0	0	1	0	63
533	93	82	11	0.8706	0.1294	1.906274247	0	1	0	2067	2607	0.061	0.071	0.08	0	0	0	0	1	85
534	93	80	13	0.913	0.087	2.350827762	0	1	0	2067	2607	0.061	0.071	0.65	0	0	0	0	0	23
535	93	79	14	0.8958	0.1042	2.151405044	0	1	0	2067	2607	0.061	0.071	0.92	0	0	0	0	0	48
536	93	78	15	0.8889	0.1111	2.079554047	0	1	0	2067	2607	0.061	0.071	0.85	0	0	0	0	0	27
537	93	77	16	0.9565	0.0435	3.090519851	0	1	0	2067	2607	0.061	0.071	0.96	0	0	0	0	0	23
538	93	76	17	0.7778	0.2222	1.252891545	0	1	0	2067	2607	0.061	0.071	0.99	0	0	0	0	0	9
539	93	74	19	0.7391	0.2609	1.041296038	0	1	0	2067	2607	0.061	0.071	0.99	0	0	0	0	0	23

APPENDIX B. RESULTS OF LOGIT ESTIMATIONS

Table B-1. Helicopter LOGIT Estimation

SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.614848246							
R Square	0.378038366							
Adjusted R Square	0.34593712							
Standard Error	0.718014121							
Observations	164							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	8	48.57020659	6.071275823	11.77643916	5.0088E-13			
Residual	155	79.90936309	0.515544278					
Total	163	128.4795697						
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.849439111	0.490385993	1.732184694	0.085229972	-0.119262569	1.818140791	-0.119262569	1.818140791
VSI/SSB	-1.238424976	0.363853281	-3.403638333	0.000846457	-1.957175695	-0.519674257	-1.957175695	-0.519674257
ACP	0.588810676	0.350462585	1.680095683	0.09495305	-0.103488247	1.281109599	-0.103488247	1.281109599
AHR	8.56541E-05	2.67794E-05	3.198506016	0.001675175	3.27544E-05	0.000138554	3.27544E-05	0.000138554
UNEMP	31.25836689	6.291982705	4.967967706	1.77039E-06	18.82927163	43.68746214	18.82927163	43.68746214
MSR	-1.056247859	0.203208369	-5.197856102	6.27425E-07	-1.457662848	-0.654832869	-1.457662848	-0.654832869
MSR+1	-1.192747002	0.200483776	-5.949344262	1.72787E-08	-1.588779869	-0.796714135	-1.588779869	-0.796714135
MSR+2	-0.602717785	0.205517915	-2.932677592	0.003870434	-1.00869502	-0.196740549	-1.00869502	-0.196740549
MSR+3	-0.050109483	0.198736918	-0.252139779	0.801267051	-0.44269163	0.342472665	-0.44269163	0.342472665

Table B-2. Propeller LOGIT Estimation

SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.81815059							
R Square	0.669370389							
Adjusted R Square	0.656078746							
Standard Error	0.60484423							
Observations	208							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	8	147.3889449	18.42361811	50.36024555	7.92732E-44			
Residual	199	72.80147194	0.365836542					
Total	207	220.1904168						
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	1.573151313	0.376415627	4.17929331	4.37732E-05	0.830875763	2.315426864	0.830875763	2.315426864
VSI/SSB	-0.19991611	0.243908334	-0.81963624	0.413404089	-0.680892933	0.281060714	-0.680892933	0.281060714
ACP (BONUS)	0.325010448	0.256377991	1.267700265	0.206386313	-0.180556008	0.830576904	-0.180556008	0.830576904
AIRLINE HIRE RATE	1.99009E-05	2.04858E-05	0.971450938	0.332503061	-2.04962E-05	6.02981E-05	-2.04962E-05	6.02981E-05
UNMEPLOYMENT	21.0778446	4.840214493	4.354733583	2.13085E-05	11.53314822	30.62254099	11.53314822	30.62254099
MSR	-2.091366906	0.165019581	-12.67344696	2.2606E-27	-2.416778476	-1.765955336	-2.416778476	-1.765955336
MSR+1	-2.244122359	0.165980759	-13.52037656	5.6587E-30	-2.57142933	-1.916815387	-2.57142933	-1.916815387
MSR+2	-1.667555257	0.165315555	-10.08710435	1.37291E-19	-1.993550476	-1.341560038	-1.993550476	-1.341560038
MSR+3	-0.88343054	0.16446738	-5.371463564	2.16869E-07	-1.207753194	-0.559107886	-1.207753194	-0.559107886

Table B-3. Jet LOGIT Estimation

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.676511586
R Square	0.457667926
Adjusted R Square	0.430208074
Standard Error	0.786158751
Observations	167

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	8	82.40674891	10.30084361	16.66680246	9.02147E-18
Residual	158	97.65120183	0.618045581		
Total	166	180.0579507			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.632742934	0.533204064	1.18668063	0.237134856	-0.420383361	1.68586923	-0.420383361	1.68586923
VSI/SSB	-1.238839406	0.3693358	-3.35423592	0.000996405	-1.968311045	-0.509367767	-1.968311045	-0.509367767
ACP(BONUS)	0.827775706	0.39051905	2.119680734	0.035595414	0.05646523	1.599086182	0.05646523	1.599086182
AIRLINE HIRE RATE	4.33287E-05	3.03059E-05	1.429708651	0.15477501	-1.65283E-05	0.000103186	-1.65283E-05	0.000103186
UNEMPLOYMENT	32.51251633	6.831883302	4.758939065	4.36295E-06	19.01892834	46.00610432	19.01892834	46.00610432
MSR	-1.877101777	0.219683343	-8.544579456	1.03148E-14	-2.310996267	-1.443207288	-2.310996267	-1.443207288
MSR+1	-1.332727164	0.21752187	-6.126865142	6.85649E-09	-1.76235255	-0.903101779	-1.76235255	-0.903101779
MSR+2	-0.582164397	0.217313136	-2.678919494	0.00816782	-1.011377513	-0.15295128	-1.011377513	-0.15295128
MSR+3	-0.252426934	0.217418847	-1.161016801	0.247386156	-0.681848838	0.176994971	-0.681848838	0.176994971

Table B-4. Combined Pilot LOGIT Estimation

SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.6564491							
R Square	0.430925421							
Adjusted R Square	0.422335616							
Standard Error	0.768522605							
Observations	539							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	8	237.0402472	29.6300309	50.16707863	3.39548E-60			
Residual	530	313.0323074	0.590626995					
Total	538	550.0725546						
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	1.047901099	0.292348498	3.584424437	0.000369016	0.473597257	1.622204941	0.473597257	1.622204941
VSI/SSB	-0.80446445	0.201445075	-3.993467943	7.43114E-05	-1.200193115	-0.408735785	-1.200193115	-0.408735785
ACP	0.536870547	0.205802548	2.608668122	0.009346115	0.132581847	0.941159247	0.132581847	0.941159247
AIRLINE HIRE RATE	4.7652E-05	1.61248E-05	2.955200579	0.003263651	1.59757E-05	7.93283E-05	1.59757E-05	7.93283E-05
UNEMPLOYMENT	27.92751411	3.753405579	7.4405799	4.07166E-13	20.55413862	35.30088959	20.55413862	35.30088959
MSR	-1.665326716	0.123130742	-13.52486548	5.12418E-36	-1.907210832	-1.4234426	-1.907210832	-1.4234426
MSR+1	-1.58782038	0.122535866	-12.95800514	1.48831E-33	-1.828535893	-1.347104867	-1.828535893	-1.347104867
MSR+2	-0.962578606	0.12331091	-7.806110644	3.17038E-14	-1.204816653	-0.720340558	-1.204816653	-0.720340558
MSR+3	-0.391512553	0.121865229	-3.212668266	0.001394994	-0.630910634	-0.152114473	-0.630910634	-0.152114473

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